HITACHI

No. 0532

CML174SXW
CML174SXWB
CML175SXW
CML175SXWB

SERVICE MANUAL
MANUEL D'ENTRETIEN
WARTUNGSHANDBUCH

CAUTION:

Before servicing this chassis, it is important that the service technician read the "Safety Precautions" and "Product Safety Notices" in this service manual.

ATTENTION:

Avant d'effectuer l'entretien du châassis, le technicien doit lire les «Précautions de sécurité» et les «Notices de sécurité du produit» présentés dans le présent manuel.

VORSICHT:

Vor Öffnen des Gehäuses hat der Service-Ingenieur die „Sicherheitshinweise" und „Hinweise zur Produktsicherheit" in diesem Wartungshandbuch zu lesen.

Data contained within this Service manual is subject to alteration for improvement.

Les données fournies dans le présent manuel d'entretien peuvent faire l'objet de modifications en vue de perfectionner le produit.

Die in diesem Wartungshandbuch enthaltenen Spezifikationen können sich zwecks Verbesserungen ändern.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

TFT LCD MONITOR

October 2002

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1. INTRODUCTION

1.1 Scope

This specification defines the requirements for the 17" MICRO-PROCESSOR based Multi-mode supported high resolution color LCD monitor, This monitor can be directly connected to general 15 pin D-sub VGA connector and DVI-D digital connector, eliminates the requirement of optional special display card. It also supports VESA DPMS power management and plug & play function. There is a build-in stereo audio amplifier with volume control to drive a pair of speakers.

1.2 Description

The LCD monitor is designed with the latest LCD technology to provide a performance oriented product with no radiation. This will alleviate the growing health concerns. It is also a space saving design, allowing more desktop space, and comparing to the traditional CRT monitor, it consumes less power and gets less weight in addition MTBF target is 20k hours or more.

Comparison Chart of CML174SXW - CML175SXW

	CML174SXW	CML175SXW
Panel	Normal 17" panel AU M170EN05 Samsung LTM170EU-L02	Normal 17" panel AU M170EN05 Samsung LTM170EU-L02
Signal Interface	DSUB+DVI-D	DSUB+DVI-D
Sync Type for analog input	Separate / compatible /	Separate / compatible /
Color Temp user adjust	SUPPORT	SUPPORT
DDC	DDC2B	DDC2B
Speaker	No	1W+1W
Headphone Jack	No	Yes
Microphone Jack	No	No
USB Hub	Not support	Not support
Tilt / Swivel	Yes / No	Yes / No
Height Adjust	Option	Option

2. ELECTRICAL REQUIREMENTS

2.1 Standard Test Conditions

All tests shall be performed under the following conditions, unless otherwise specified.

Ambient light:	225 lux
Viewing distance :	50 cm in front of LCD panel
Warrn up time	
All specifications:	30 minutes
Fully functional:	5 seconds
Measuring Equipment:	Chroma 2250 signal generator or equivalent, directly Connected to the monitor under test. Minolta CA100 photometer, or equivalent
Control settings	
User brightness control:	Maximum (unless otherwise specified)
User contrast control:	Typical (unless otherwise specified)
User red/white balance, Green/white balance and Blue/white balance control:	In the center (unless otherwise specified)
Power input :	110Vac or 230Vac
Ambient temperature :	20 ± 5 ˚C (68 ± 9 ˚ F)
Analog input mode :	1280 x1024 /60 Hz

2.1.1 MEASUREMENT SYSTEMS

The units of measure stated in this document are listed below:

1 gamma = 1 nano tesla
1 tesla = 10,000 gauss

cm = in x 2.54
lb = kg x 2.2

degrees F = [°C x 1.8] + 32
degrees C = [°F - 32]/1.8

u' = 4x/(-2x + 12y + 3)
v' = 9y/(-2x + 12y + 3)

x = (27u'/4)/[(9u'/2) - 12v' + 9]
y = (3v')/[(9u'/2) - 12v' + 9]

nits = cd/(m^2) = Ft-L x 3.426
lux = foot-candle x 10.76

2.2 LCD monitor General specification

Panel Type : 17 " active matrix color TFT LCD

1). AU 17" M170EN05

Display size : 337.92mm(H) x 270.34mm(V)

Display mode :	VGA	720 X 400 (70 Hz)
	VGA	640 X 480 (60/66/70/72/75 Hz)
	SVGA	800 X 600 (60/70/72/75 Hz)

	XGA 1024 X 768 (60/70/75 Hz)	
	SXGA 1280 X 1024 (60/70/75 Hz)	standard resolution
Pixel pitch :	0.098x3mm(H) x 0.294mm(V)	
Display Dot :	1280 x (RGB) x 1024	
Pixel Clock :	25.2 – 135.0MHz	
Contrast ratio: $\theta = 0^\circ$	400 : 1 (typical)	
Brightness:	260 cd/m^2 (typical)	
Response time (Tr/Tf) :	12 /4.0 msec	
Display color :	16777216 (8 bite color)	
Viewing angle: L / R	• 80 / • 80	(• 170 degrees horizontal typical)
U / D	• 80 / • 80	(• 170 degrees vertical typical)
Luminance Uniformity :	> 80 %	
Pc interface: 1). Video :	RGB analog 0.7V peak to peak	
Sync :	TTL positive or negative	
2). Digital TMDS		
Signal connector :	15 pin Mini D type, (standard VGA video)	
	DVI-D connector	
	3.5 mm stereo audio jack(Audio)(CML175SXW)	
	3.5 mm miniature stereo Headphone jack(CML175SXW)	
Audio power :	1Wrms + 1Wrms (300Hz – 10kHz (S.P.L. – 10 dB)) (CML175SXW)	
Front control :	power on/off with LED select (up, down) adjustment (+,-)	
Interface frequency		
• Horizontal Frequency	24KHz --80KHz(analog), 31.5– 80KHz(digital)	
• Vertical Frequency	56Hz ----75Hz	
Plug & play :	Support VESA DDC2B functions	
Power Input voltage :	Single phase, 50/60HZ, 100VAC to 240VAC ±10%	
Total output power :	48 Watt max.	

2.3 LCD Panel Specification

2.3.1 LCD Panel Model (FUJITSU FLC48SXC8V)

- Display Type active matrix color TFT LCD
- Resolution 1280 x 1024 pixels
- Display Dot 1280 x (RGB) x 1024

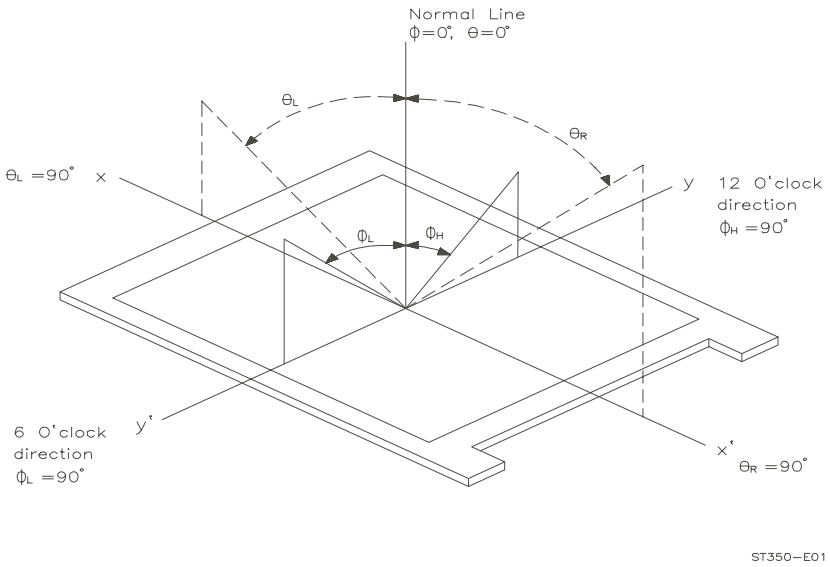
- Display Area 337.92mm(H) x 270.34mm(V)
- Pixel Pitch 0.264mm(H) x 0.264mm(V)
- Display Color 262K (6 bit color)
- Lamp Voltage 700 Vrms typ.
- Lamp Current 7mA rms.(typ). 4 Lamp
- Weight 2000g .
- Optical Specifications

  The following items are measured under stable conditions. The optical characteristics should be measured in a dark room or equivalent state with the methods shown in Note(4).

  ◆Measuring equipment : TOPCON BM-5A, BM-7, PHOTO RESEARCH PR650

(Inverter Freq. : 54kHz) *Ta =25 ± 2°C, VDD=5V, fv=60 Hz, fDCLK=54 MHz, IL= 6.5mArms

Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Contrast Ratio (Center of screen)		CR	Normal $\phi = 0^\circ$ $\theta = 0^\circ$ Viewing Angle	250	400	-		(1)(2)(4) BM-5A
Response Time	Rising	T_R		-	12	20	msec	(1)(3) BM-7
	Falling	T_F		-	4.0	5		
Luminance of White (Center of screen)		Y_L		200	260	-	cd/m2	(5) BM-5A
Color Chromaticity (CIE 1931)	Red	Rx		TYP. -0.03	0.64	TYP. +0.03		(1)(4) PR650
		Ry			0.34			
	Green	Gx			0.29			
		Gy			0.61			
	Blue	Bx			0.14			
		By			0.07			
	White	Wx			0.31			
		Wy			0.33			
Viewing Angle	Hor.	θ_L	CR≥5	70	80	-	Degrees	(1)(4) BM-5A
		θ_R		70	80	-		
	Ver.	ϕ_H		70	80	-		
		ϕ_L		70	80	-		
Brightness Uniformity (9 points)		B_{UNI}		75	-	-	%	(6) BM-5A

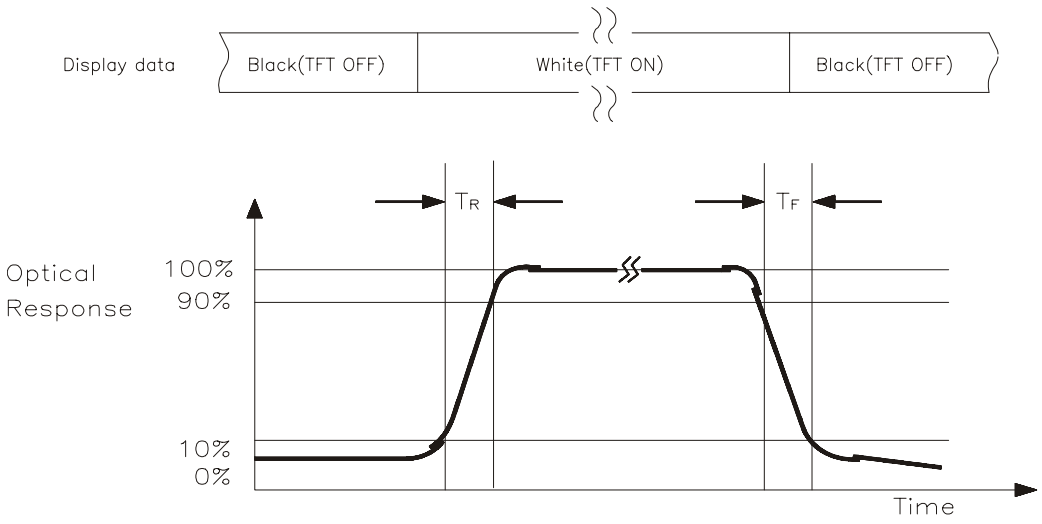


Note 1) Definition of Viewing Angle: Viewing angle range (10≤CR)

Note 2) Definition of Contrast Ratio (CR): Ratio of gray max(Gmax),gray min(Gmin) at the center point of panel.

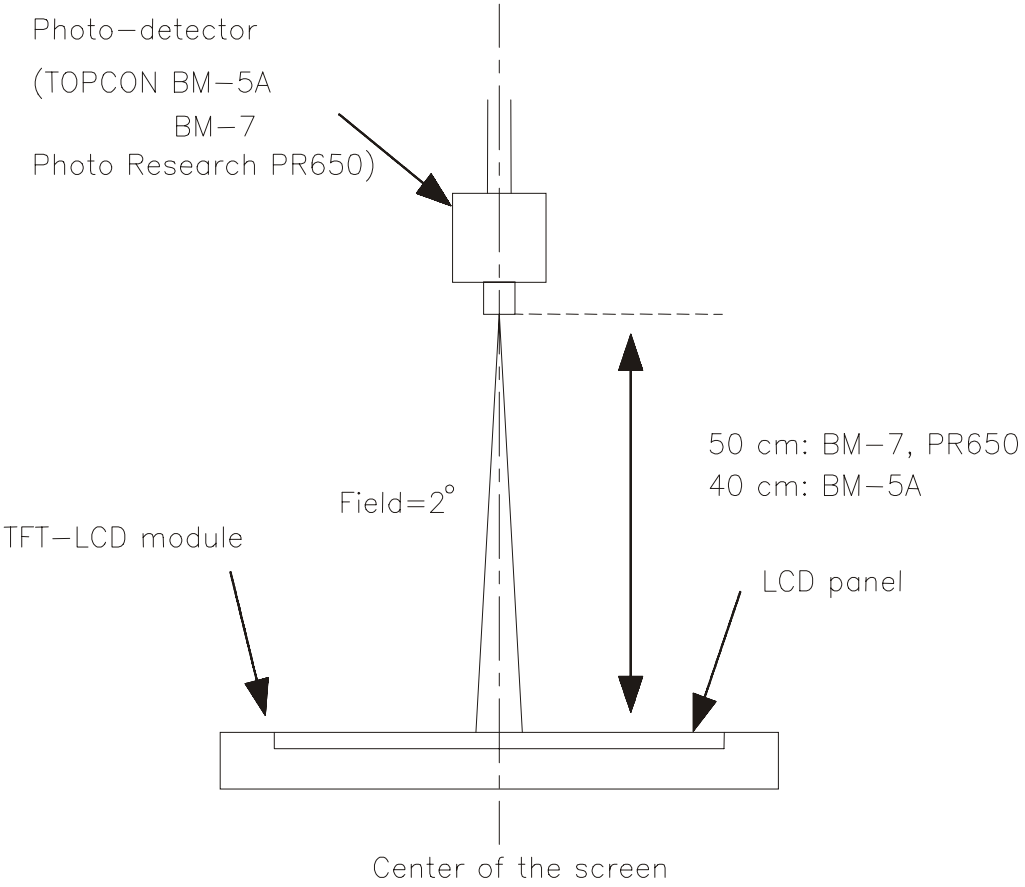
$$CR = \frac{\text{Luminance with all pixels white (Gmax)}}{\text{Luminance with all pixels black (Gmin)}}$$

Note 3) Definition of Response time: Sum of T_R , T_F



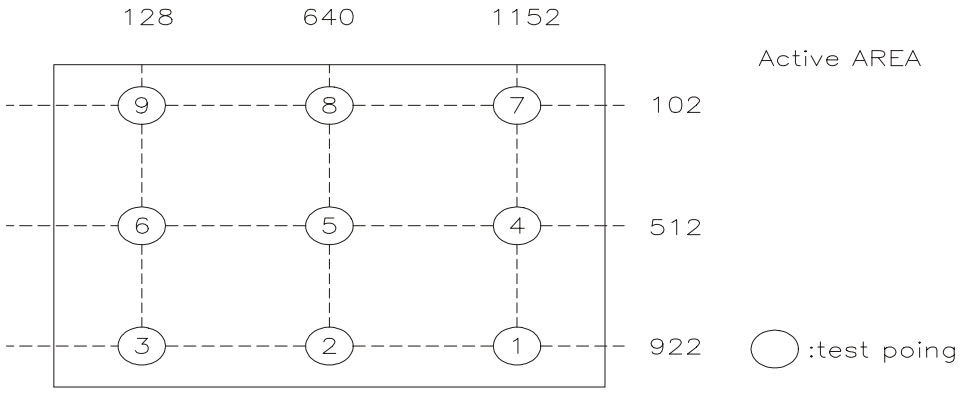
Note 4) After stabilizing and leaving the panel alone at a given temperature for 30 min, the measurement should be executed .Measurement should be executed n a stable, windless ,and dark room.30 min after lighting the back-light. This should be measured in the center of screen. Dual lamp current :13.0mA(6.5mA x2)(Refer to the note(1) in the page 14 for more information).

Environment condition :Ta=25±2°C



Optical characteristics measurement setup

Notes 5) Definition of Luminance of White : measure the luminance of white at center point.



Notes 6)Definition of 9 points brightness uniformity (Measuring points: Refer to the Note 5)

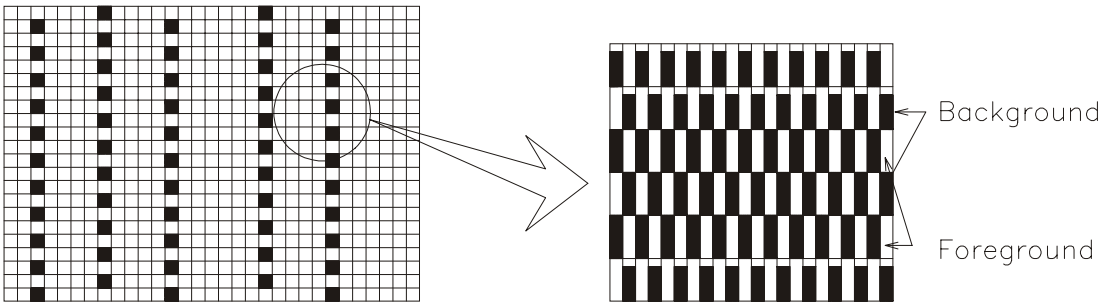
$$B_{UNI} = 100 * \frac{Bmin}{Bmax}$$

Bmax: Maximum brightness
Bmin: Minimum brightness

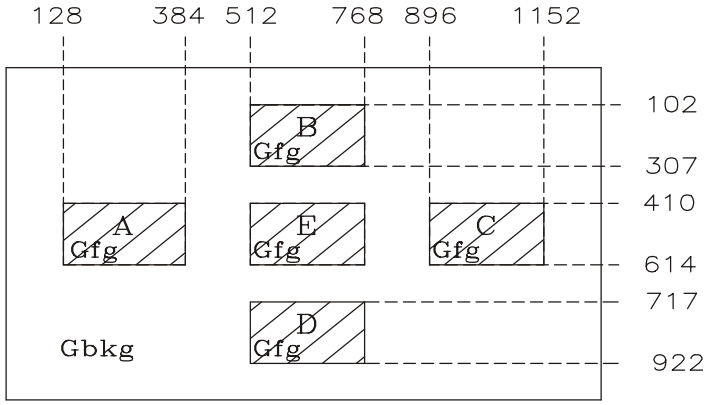
Notes 7) Definition of Flicker level

$$F = \frac{\text{Flicker Voltage}_{pp}}{\text{LMD Voltage}_{dc}} \times 100\ \%$$

- One maximum value of three estimated values.
- For this test ,an LMD(Light Measurement Device)is needed with adequate response time to track any visible rate flicker component and with a voltage level output proportional To luminance intensity.
- Test Pattern: For dot inversion Driving(Gray levels of foreground dots on the test panel Are G22,G32,and G45)
- Test Point :Center point of the display area



Note 8) Definition of Crosstalk (Refer to the VESA STD)



The calculation for shadowing is made from the 2 luminance measurements Gbkg and Lsh, as follows:

$$C_T = \frac{\mathbf{Lmax - Lmin}}{\mathbf{Lmin}} \mathbf{x100\ \%}$$

Where Lmax is the larger value of Gbkg or Lsh , and Lmin is the smaller of the two.

- To determine background and foreground levels (colours),first set the background to any gray scale or color level suitable for shadowing determination.(Note that it may take several iterations of adjusting background level and box levels to determine the proper value for the background .Next display the box levels to determine the proper value for the background level. Look for shadowing in any direction from box E. Independently vary the gray level (or color) of the background and box E until the worst case shadowing is observed. This defines the background (Gbkg) and foreground (Gfg) levels to be maintained for the remainder of the test.

- One point only (the target) will be measured. To determine that point proceed as follows Using the background and foreground gray levels of step1 (Gbkg and Gfg). Turn on each box at a time. Look for the case with the worst shadowing. The box causing the worst case is the shadowing source, or Bsrc. Use Bsrc and the box opposite from it that lies directly in the shadow path. That is the target box, or Btgt. Note that box Eight be either Bsrc or Btgt, depending on the shadowing conditions, but typically Bsrc and Btgt will be a pair of opposite boxes, A&C or B&D. Btgt will only be displayed for aligning the LMD. It will be turned off for the actual measurement.

- The target box point (Btgt) will be measured with the source box (Bsrc) turned on then off. (Btgt is for alignment purpose only) Display the background only at level Gbkg. Display Btgt determined in step 2 above. Using the correct distance, angle, and measurement aperture, align the LMD to the center of the Btgt. Turn off Btgt. With Gbkg set to its proper level, measure the luminance (or color). Next,turn on the source box Bsrc. Again measure at the center point of Btgt (without Btgt present.). In this case the LMD will be measuring the shadowing level, Lsh.

2.4 Input Signals

2.4.1 Video input

- Type Analog R, G, B., Digital TMDS
- Input Impedance 75 ohm +/- 2%
- Polarity Positive
- Amplitude 0 - 0.7 +/- 0.05 Vp
- Display Color same as LCD panel

2.4.2 Sync input

- Signal separate horizontal and vertical sync, or composite sync which are TTL compatible
- Polarity positive and negative.

2.4.3 Interface frequency

The following frequency range is generalized by supported timing. If the entered mode does not match the supported timing the display optimization will not be assured.

- Horizontal Frequency 24KHz --80KHz(analog), 31.5– 80KHz(digital)
- Vertical Frequency 56Hz ---------75Hz

DISPLAY MODES

MONITOR MODE NO.	SCREEN RESOLUTION	HORIZONTAL SYNC RATE (kHz)	VERTICAL SYNC RATE (Hz)	VIDEO CLK (MHz)	STANDARD
1	640x350	31.5 +	70.0 -	25.0	VGA
2	640X400	24.83 -	56.4 -	21.05	NEC
3	640X400	31.5-	70.0+	25.0	VGA
4	640X400	31.5-	70.1-	25.19	NEC
5	640X480	31.5 -	60.0 -	25.0	Defacto
6	640X480	35.0-	66.67-	30.24	MAC
7	640X480	37.86-	72.80-	31.5	VESA
8	640X480	37.5-	75.0-	31.5	VESA
9	720X400	31.5 -	70.0 +	28.0	Text Defacto
10	832X624	49.72-	74.55 -	57.28	MAC
11	800X600	35.16+	56.25+	36.0	SVGA
12	800X600	37.8 +	60.0 +	40.0	VESA
13	800X600	48.07 +	72.18 +	50.0	VESA
14	800X600	46.87+	75.0+	49.5	VESA
15	1024X768	48.4 -	60.0 -	65.0	VESA
16	1024X768	53.96 +	66.13 +	71.66	XGA
17	1024X768	56.47 -	70.07 -	75.0	VESA
18	1024X768	60.0 +	75.0 +	78.75	VESA
19	1024x768	60.24-	75.02-	80.0	MAC-768
20	1280X1024	64.0 +	60.0 +	108.5	SXGA
21	1280X1024	80.0 +	75.0 +	135.0	Defacto

Supported Timing

TIMING	FH(KHZ) FV(HZ)	SYNC POLARITY	TOTAL (DOT/LINE)	ACTIVE (DOT/LINE)	SYNC WIDTH (DOT/LINE)	FRONT PORCH (DOT/LINE)	BACK PORCH (DOT/LINE)	PIXEL FOREQ.(MHZ)
640x350	31.469	+	800	640	96	16	48	25.175
VGA-350	70.087	–	449	350	2	37	60	
640x400	24.83	–	848	640	64	64	80	21.05
NEC PC9801	56.42	–	440	400	8	7	25	
640x400	31.469	–	800	640	96	16	48	25.175
VGA-GRAPH	70.087	+	449	400	2	12	35	
640x400	31.5	–	800	640	64	16	80	25.197
NEC PC9821	70.15	–	449	400	2	13	34	
640x480	31.469	–	800	640	96	16	48	25.175
VGA-480	59.94	–	525	480	2	10	33	
640x480	35.00	–	864	640	64	64	96	30.24
APPLE MAC-480	66.67	–	525	480	3	3	39	
640x480	37.861	–	832	640	40	16	120	31.5
VESA-480-72Hz	72.809	–	520	480	3	1	20	
640x480	37.5	–	840	640	64	16	120	31.5
VESA-480-75Hz	75	–	500	480	3	1	16	
720x400	31.469	–	900	720	108	18	54	28.322
VGA-400-TEXT	70.087	+	449	400	2	12	35	
832x624	49.725	–	1152	832	64	32	224	57.2832
APPLE MAC-800	74.55	–	667	624	3	1	39	
800x600	35.156	+	1024	800	72	24	128	36
SVGA	56.25	+	625	600	2	1	22	
800x600	37.879	+	1056	800	128	40	88	40
VESA-600-60Hz	60.317	+	628	600	4	1	23	
800x600	48.077	+	1040	800	120	56	64	50
VESA-600-72Hz	72.188	+	666	600	6	37	23	
800x600	46.875	+	1056	800	80	16	160	49.5
VESA-600-75Hz	75	+	625	600	3	1	21	
1024x768	48.363	–	1344	1024	136	24	160	65
XGA	60.004	–	806	768	6	3	29	
1024x768	53.964	+	1328	1024	176	16	112	71.664
COMPAQ-XGA	66.132	+	816	768	4	8	36	
1024x768	56.476	–	1328	1024	136	24	144	75
VESA-768-70Hz	70.069	–	806	768	6	3	29	
1024x768	60.023	+	1312	1024	96	16	176	78.75
VESA-768-75Hz	75.029	+	800	768	3	1	28	
1024x768	60.24	–	1328	1024	96	32	176	80
APPLE MAC-768	75.02	–	803	768	3	3	29	
1280x1024	64	+	1688	1280	112	48	248	108
VESA-1024-60Hz	60	+	1066	1024	3	1	38	
1280x1024	80	+	1688	1280	144	16	248	135
VESA-1024-75Hz	75	+	1066	1024	3	1	38	

If the input timing is not a supported timing listed above but within the supported frequency range (Horizontal: 80KHz,Vertical: 75Hz), this monitor will select a closest mode instead. But the display quality may not be optimized.

If the input timing over the supported frequency range, a message “Input Signal Out of Range” will be shown.

2.4.4 85Hz refresh rate Support

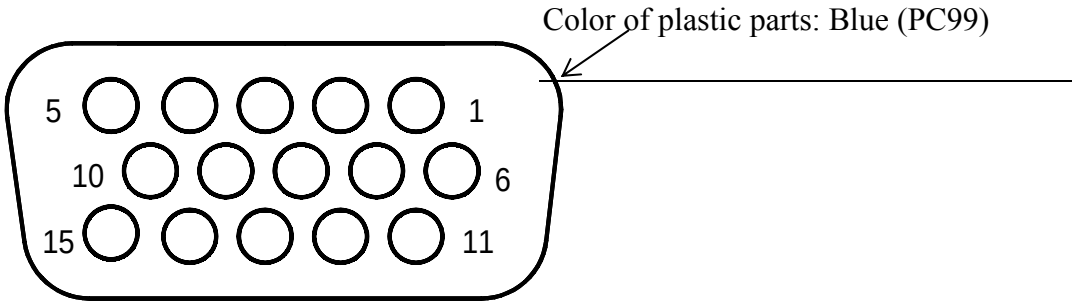
Monitor should display 85Hz refresh rate mode as emergency mode.
Monitor should display “Out of Range” warning menu at this mode.

2.4.5 Video input Connector

Analog Video input Connector: 15pins mini D-Sub

Table 2.4.5. Pin assignment for D-sub connector

PIN NO.	Separate Sync
1	RED VIDEO
2	GREEN VIDEO
3	BLUE VIDEO
4	GROUND
5	GROUND
6	RED GROUND
7	GREEN GROUND
8	BLUE GROUND
9	PC5V (+5V DDC)
10	CABLE DETECTION
11	GROUND
12	SDA
13	H.SYNC
14	V.SYNC
15	SCL



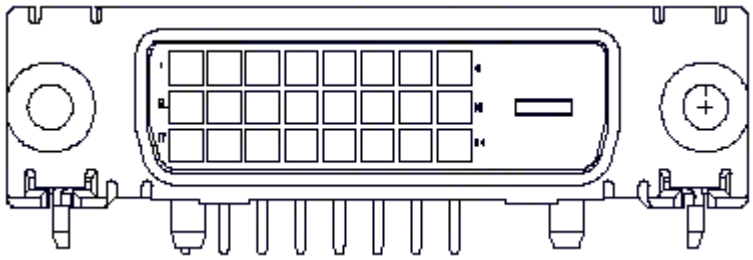
D-sub connector

Digital Video input Connector: DVI-D (T.B.D)

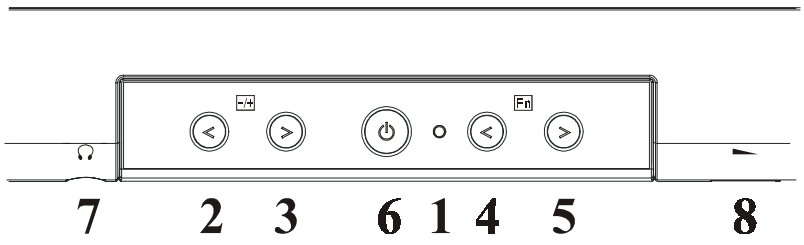
Table 4-3-3. Pin assignment for DVI-D (24pin) connector

Pin – Assignment of DVI –D connector :					
1	TX2-	9	TX1-	17	TX0-
2	TX2+	10	TX1+	18	TX0+
3	Shield (TX2 / TX4)	11	Shield (TX1 / TX3)	19	Shield (TX0 / TX5)
4	NC	12	NC	20	NC
5	NC	13	NC	21	NC
6	DDC-Serial Clock	14	+5V power *)	22	Shield (TXC)
7	DDC-Serial Data	15	Ground (+5V)	23	TXC+
8	No Connect	16	Hot plug detect	24	TXC-

*) In case, the power of the PC unit is switched off and the power of the monitor is switched on, no voltage may occur at pin 14.



2.5 CONTROLS



2.5.1 Control panel (monitor front panel)

1. *Power LED, will be green when monitor is on; be amber when in power saving mode.*
2. *Adjust decrease.*
3. *Adjust increase.*
4. *Function select counter-clockwise.*
5. *Function select clockwise.*
6. *Power ON/OFF switch, push to ON and push to OFF. (toggle switch)*
7. *Ear phone jack. (CML175SXW only)*
8. *Volume Control. (CML175SXW only)*

Note: When OSD Menu is off, press button 2 and 3 at the same time can activate "Auto Adjustment" immediately.

2.5.2 OSD Functions

- OSD Format: Refer to following figure.
- OSD Border: Cyan color
- OSD Tunable Item: The 16 icons that around the border.
- Selected Item: Yellow background
- Comment: Magenta foreground, Blue background

page format :

Description:

- Brightness: Brightness adjustment, the range from 0 to 100. Default = 100
- Contrast: Contrast adjustment, the range from 0 to 100. Default = 50
- H. Position: Horizontal position adjustment.
- V. Position: Vertical position adjustment.
- Phase: Focus adjustment, the range from 0 to 255 steps.
- OSD position: OSD position adjustment.
- Auto Adjustment: This feature will automatically adjust size, position, clock and phase. It takes 3-5 seconds to finish. When auto start, it shows "Auto Adjusting…." message.
- Clock: Frequency tracking adjustment. The max range from -50 to +50, but some modes the range will be limited.
- Graph Text: 640x400(GRAPH) or 720x400(TEXT) mode select.
- Language: 5 kinds of language for description, including (English, German, French, Spanish, Italian)
- Recall: Recall the default value.
- Color Temp: Color temperature for standard 9300,6500, 7500 or user defined.
  - User:

    User R: Red signal gain by user defined.

    User G: Green signal gain by user defined.

    User B: Blue signal gain by user defined.
  - 7500: Set CIE coordinate at 7500°K color temperature.
  - 6500: Set CIE coordinate at 6500°K color temperature.
  - 9300: Set CIE coordinate at 9300°K color temperature.
- Exit: Exit OSD menu function.

Sharpness : Adjust the scale-up effect(smoother or sharper.)

OSD Transparency: Adjust the transparency level of OSD. The range is from 0 to 100 scales.

Comment:

- 1280x1024: Current mode resolution.
- 60 HZ: Current mode vertical frequency±1Hz.
- VER 1.00: Firmware revision.

- Other features:

  - Intellectual-Auto CML174SXW/175SXW can start the Auto-Adjustment automatically when input a new display mode at first time. After the adjustment, CML174SXW/175SXW will remember this mode and switch to optimized condition automatically for this mode whenever encounter this mode again. Total 27 recent used modes are recorded into CML174SXW/175SXW

  - VESA DPMS Functionality When signaled by the host CPU, CML174SXW/175SXW show a black screen about 3 seconds. If no further signal, then it shows "No Signal" and enter power saving mode.

2.6 White Color Temperature

White color temperature is 4 preset as 9300, 7500,6500 and User,
Default value of user color should be user which is maximum setting for panel.

Target of color setting

Color Temp.	Color Coordinate		Tolerance	Color Coordinate		Tolerance
	x	y		u'	v'	
9300K	0.281	0.297	±0.03	0.189	0.446	□u'v' ≤ 0.01*
7500K	0.299	0.315	±0.03	0.194	0.459	□u'v' ≤ 0.01*
6500K	0.313	0.329	±0.03	0.198	0.469	□u'v' ≤ 0.01*
User	-	-		-	-	-

*) TCO'0X A.2.6.1 requirement

User should follow "Microsoft Windows Color Quality Specification for Liquid Crystal Display OEM's".
(http://www.microsoft.com/hwdev/tech/color/ColorTest.asp)

2.7 POWER SUPPLY

2.7.1 input Voltage Range

The monitor shall operate within specification over the range of 90 to 265 VAC power supply.

2.7.2 Input Frequency Range

Input power frequency range shall be from 47.5 to 63 Hz over the specified input voltage range.

2.7.3 Quick specification review

- Input current

  1.2A (max) at 90VAC input and full load ,
  0.6A (max) at 264 VAC input and full load.

- Inrush current @ cold start

  30A(0-peak)@ 110Vac ,50A(0-peak) @ 220Vac

  (measured when switched off for at least 10 mins.)

- Output

	Tolerance	Output Current		Volt Tolerance
Output Volt	-	MIN	MAX	
+5Vdc	±5%	0A	1.0A	4.8~5.2V dc
+5Vdc	±5%	0A	1.5A	4.8~5.2V dc
+12Vdc	±5%	0A	2.2A	11.4~12.6Vdc

- Total output power: 48 Watt max.
- Withstanding voltage : 1.5Kvac or 2.2KVdc for 1 minute.
- Leakage current : < 0.25mA/100Vac , <3.5mA/230Vac
- Efficiency : 80% min. @115V/230VAC, maximum load.

2.7.4 Power Management

2.7.4.1 Meet VESA DPMS proposal

The monitor must comply with the Microsoft On Now specification, with a minimum of three power management states, as defined by the VESA DPMS document. The front panel of the monitor must appropriately display the DPMS state, For example:

DPMS ON : The power LED is Green
DPMS OFF : The power LED is Amber

2.7.5 Power Consumption

On mode	48 Wmax	Green
Off mode	3 Wmax	Amber
DC power off	3 Wmax	Dark
Power SW off	1 Wmax	Dark
disconnection	3 Wmax	Dark (DC power off) Amber (DC power on)

- ◆ Power saving states are measured with speakers attached but not worked.
- ◆ The recovery time from stand by /suspend/off mode to on mode is 3 seconds maximun.

2.7.6 Power Connector

All units shall have an IEC/CEE-22 type male power receptacle.

2.8 Plug & Play(EDID)

The monitor will be capable of sending a VESA standardized EDID file through the DDC (pins 12, 15 of the VGA connector).

2.9 Audio Technical specification (CML175SXW)

2.9.1 General Description:

Output power : 1W + 1W maximum

Total harmonic distortion : Less than 1 % (except speakers distortion)

Input signal sensitivity : 0.5 Vrms for full output

Input impedance : 47 Kohm +/- 5 %

Frequency response range : 100Hz – 20kHz (except speakers response)

Difference of L and R output : Less than 2 dB

2.9.2 Electrical characteristics (Tamb=25°)

Audio amplifier(USE Panasonic VP-7723A Audio Analyzor.)

Item	Audio Input	Freq.	Spec.			Comment
			Min.	Typ.	Max.	
Input Voltage(V)			-	5	-	
Input Current(m A)			-	500	800	
Audio Voltage Gain	500m Vrms	1KHz	-	-	6 d B	Volume Max.,load 4 Ω
Frequency Response	500m Vrms	300Hz-20KHz	-10dB	-	+10d B	Volume Max.,load 4 Ω
Signal to Noise ratio	500m Vrms	1KHz	-	-	-40dB	Volume Max.,load 4 Ω
Total harmonic distortion	500m Vrms	1KHz			1%	except speakers distortion
Cross talk	500m Vrms	1KHz	-	-	-30dB	Volume Max.,load 4 Ω
Output Watt.	500m Vrms	1KHz	-	-	1W	Volume Max.,load 4 Ω
Volume Control			-	-	-	Analog

2.9.3 Speakers

Maximum power : 1 W per speaker(max)

Impedance : 4 ohm +/- 15 % @ 1kHz 1.0Hz

Frequency response range : 300 Hz – 20 kHz (S.P.L. – 10 dB)

Total harmonic distortion : Less than 5 % @ 0.125 W 1kHz

2.9.4 Headphone output

Output power : 1.6 mW for 32 ohms Headphone

3. VL-713 DISPLAY CONTROL BOARD

3.1 Description

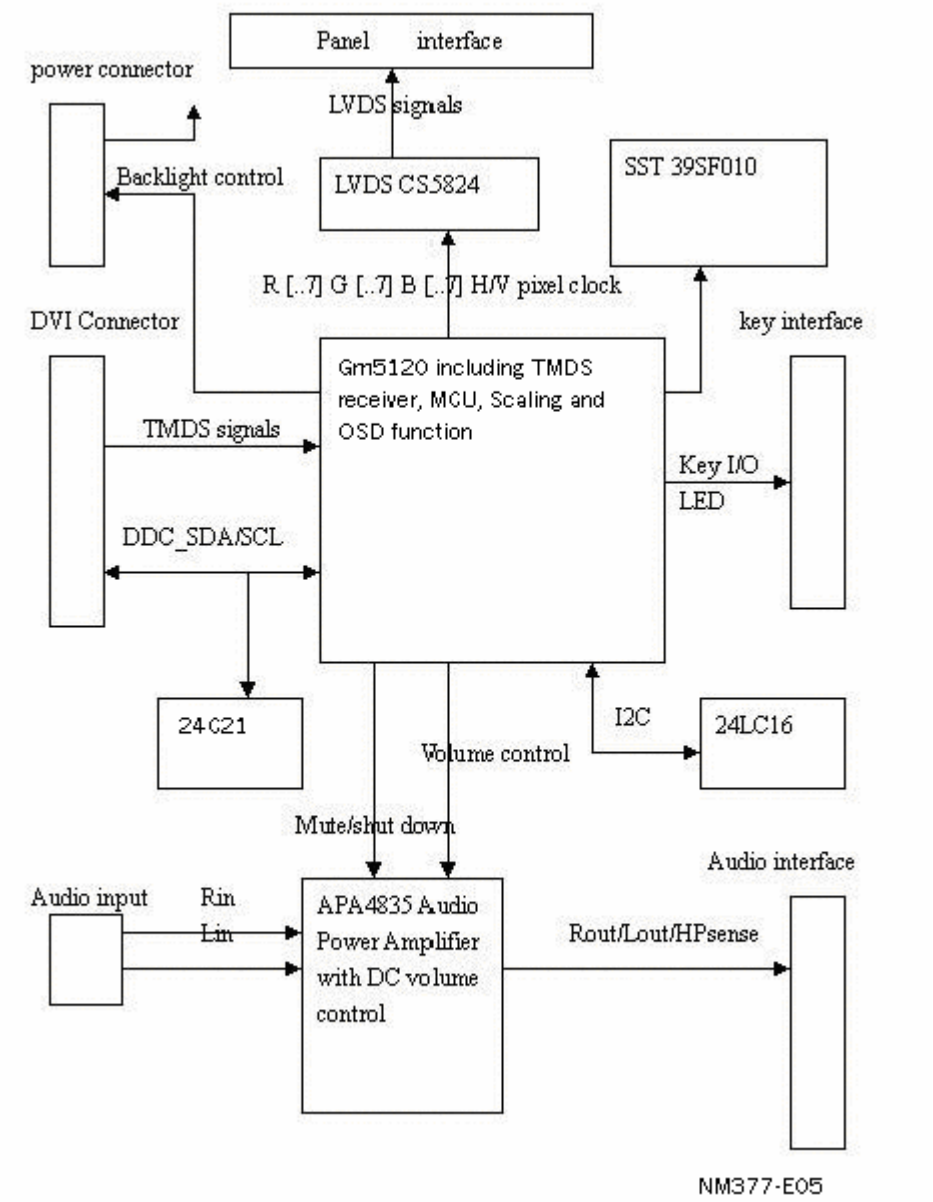
The VL-713 display control board is design to directly receive R, G, B Analog and TMDS DVI signal to optimum LCD timing signals so as to construct a high display quality LCD monitor.

3.2 Features

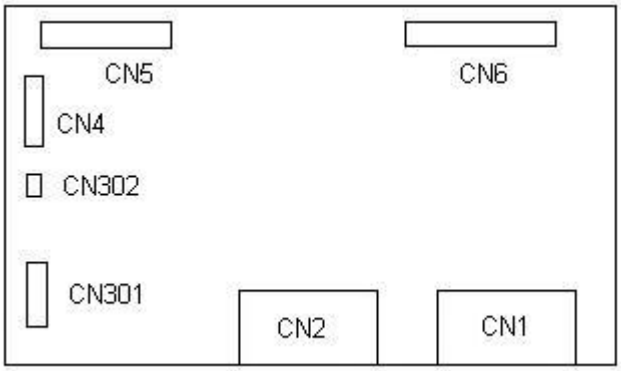
- Support for image expansion and reduction.
- On board micro-processor to detect display timings and control user functions.
- Using Genesis design to generate optimum LCD timings.
- Using E^2PROM to memorize every adjusted parameter.
- Support up to 25 display modes from VGA to SXGA.
- Support up to 5 display modes from VGA to SXGA by TMDS.
- Offer full screen expansion function on non-XGA mode (automatic).
- Support OSD functions.
- Support VESA DPMS function.
- Support DDC1/2B functions.
- Support English and Japanese language for OSD description.
- The longest time for mode change is 3 seconds.

3.3 BLOCK DIAGRAM

System Block Diagram



3.4 Connector Locations



3.5 Connector Type

Location	Type	Maker	Number of pins
CN1	DVI-D	FEMALE	24
CN4	96113-0803	E&T	8
CN6	4501-10	E&T	10
CN5	98210-4011	E&T	40
CN302	98115-0313	E&T	3
CN301	4300-11P	E&T	11
CN2	D-SUB	E&T	15

3.6 Connector pin assignment

3.6.1 CN1

Pin #	Signal Name	Description	Pin #	Signal Name	Description
1	RX2-	TMDS negative differential	16	HTPLG	+5V Supply
2	RX2+	TMDS positive differential output, channel 2	17	RXO-	TMDS negative differential output, channel 0
3	RX2 SHILD	Shield for TMDS channel 2	18	RXO+	TMDS positive differential output, channel 0
4	NC	do not connect	19	RX0	shield for TMDS channel 0
5	NC	do not connect	20	NC	do not connect
6	DDC/SCL	DDC2B clock	21	NC	do not connect
7	DDC/SDA	DDC2B data	22	RXC SHILD	Shield for TMDS clock
8	Analog Vs	Analog V-sync	23	RXC-	TMDS negative differential output, reference clock
9	RX1-	TMDS negative differential output, channel 1	24	RXC+	TMDS positive differential output, reference clock
10	RX1+	TMDS positive differential output, channel 1			
11	RX1 SHILD	Shield for TMDS channel 1			
12	NC	do not connect			
13	NC	do not connect			
14	DOC +5VDC	DDC2B logic +5V			

15	DDC GND	DDC2B logic GND			

3.6.2 CN5

PIN No.	Symbol	Function
38	V_{DD}	Power Supply : +5V
39	V_{DD}	
40	V_{DD}	
35	NC	No Connection
36	NC	No Connection
37	NC	No Connection
1,2,3	GND	Power Ground
17	RXE3+	Positive Transmission Data of Pixel 3 (EVEN data)
16	RXE3-	Negative Transmission Data of Pixel 3 (EVEN data)
14	RXEC+	Positive Sampling Clock (EVEN data)
13	RXEC-	Negative Sampling Clock (EVEN data)
11	RXE2+	Positive Transmission Data of Pixel 2 (EVEN data)
10	RXE2-	Negative Transmission Data of Pixel 2 (EVEN data)
6,9,12	GND	Power Ground
8	RXE1+	Positive Transmission Data of Pixel 1 (EVEN data)
7	RXE1-	Negative Transmission Data of Pixel 1 (EVEN data)
15,18,21,24	GND	Power Ground
5	RXE0+	Positive Transmission Data of Pixel 0 (EVEN data)
4	RXE0-	Negative Transmission Data of Pixel 0 (EVEN data)
32	RXO3+	Positive Transmission Data of Pixel 3 (ODD data)
31	RXO3-	Negative Transmission Data of Pixel 3 (ODD data)
29	RXOC+	Positive Sampling Clock (ODD data)
28	RXOC-	Negative Sampling Clock (ODD data)
30,33,34,27	GND	Power Ground
26	RXO2+	Positive Transmission Data of Pixel 2 (ODD data)
25	RXO2-	Negative Transmission Data of Pixel 2 (ODD data)
23	RXO1+	Positive Transmission Data of Pixel 1 (ODD data)
22	RXO1-	Negative Transmission Data of Pixel 1 (ODD data)
20	RXO0+	Positive Transmission Data of Pixel 0 (ODD data)
19	RXO0-	Negative Transmission Data of Pixel 0 (ODD data)

3.6.3 CN302

Pin No.	Signal	Comment
1	Audio-RIN	Audio Right Input
2	GND	
3	Audio-LIN	Audio Left Input

3.6.4 CN301

Pin No.	Signal	Comment
1	+5 VDD	Audio +5V
2	VR	Audio Volume Control
3	L+	Audio Left+ Output
4	L-	Audio Left- Output
5	AGND	Analog GND
6	HP-S	HP-Sense
7	HP-L	Audio Left Output (Head Phone)
8	HP-R	Audio Right Output (Head Phone)
9	AGND	Analog GND
10	R+	Audio Right+ Output
11	R-	Audio Right- Output

3.6.5 CN6

Pin NO.	Signal	Comment
1	+5 V	Audio Power
2	GND	Audio GND
3	GND	GND
4	GND	GND
5	BRIGHT	Brightness Adjustment
6	PS	Power Saving
7	PBIAS	Back Light ON/OFF
8	+5VB	From USB power
9,10	+5V	From main power

3.6.6 CN4

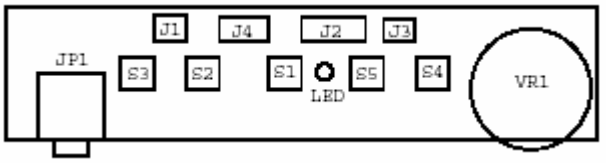
Pin NO.	Signal	Comment
1	LED-Y	Power saving mode
2	LED-G	Monitor is ON
3	GND	GND
4	KEY-ON/OFF	KEY- ON/OFF
5	KEY–UP	KEY-Brightness Increase
6	KEY-DOWN	KEY-Brightness Decrease
7	KEY-RIGHT	KEY-Volume Increase
8	KEY-LEFT	KEY-Volume Decrease

4. VK-713 Control Panel Board

4.1 Description

The VK-713 is designed to offer a user interfaced control panel which passes and receives signals to and from VK-713 display control board.

4.2 Connector and Switch Locations



4.3 Connector type

Location	*Type*	*Maker*	*Number of pins*
J4	*4301-08*	*E&T*	*8*
J2	*4301-11*	*E&T*	*11*
J1	*87502-0200*	*ACER*	*2*
J3	*87502-0200*	*ACER*	*2*
JP1	*SCJ-0348-C*	*SC*	*9*

4.4 Connector pin Assignment

4.4.1 J4

Pin NO.	*Signal*	*Comment*
1	*KEY-LEFT*	*Function select counter-clockwise key*
2	*KEY-RIGHT*	*Function select counter-clockwise key*
3	*KEY-DOWN*	*Adjust down key*
4	*KEY-UP*	*Adjust up key*
5	*KEY-POWER*	*Power ON/OFF key*
6	*GND*	*GND*
7	*LED-G*	*Power is ON*
8	*LED-Y*	*Power is OFF*

4.4.2 J2

Pin NO.	*Signal*	*Comment*
1	*+5 VDD*	*Volume Control*
2	*Volume*	*Volume Control*
3	*L OUT+*	*Audio Output L+*
4	*L OUT-*	*Audio Output L-*
5	*AGND*	*Audio GND*
6	*HP-S*	*Audio Earphone sensor*
7	*HP-L*	*Audio Earphone Output L*

8	*HP-R*	*Audio Earphone Output R*
9	*AGND*	*Audio GND*
10	*R OUT-*	*Audio Output R+*
11	*R OUT+*	*Audio Output R-*

4.4.3 J3

Pin NO.	*Signal*	*Comment*
1	*L+ OUT*	*Audio Output L+*
2	*L- OUT*	*Audio Output L-*

4.4.4 J1

Pin NO.	*Signal*	*Comment*
1	*R+ OUT*	*Audio Output R+*
2	*R-OUT*	*Audio Output R-*

4.5 Switch definition

Location	*Definition*
S1	*Power ON/OFF*
S4	*Function select by clockwise direction*
S5	*Function select by counter-clockwise direction*
S2	*Adjust up*
S3	*Adjust down*

4.6 LED definition

Location	*Definition*
D1	*Green for ON mode; Yellow for OFF mode; yellow for Power Saving mode; Dark for DC power OFF mode.*

5. POWER SUPPLY & INVERTER BOARD

5.1 Description

The Power supply and Inverter board is designed for Display control board and lighting up the back-lights of LCD module.

5.2 Power supply (AC to DC section)

5.2.1 input Voltage Range

The monitor shall operate within specification over the range of 90 to 265 VAC power supply.

5.2.2 Input Frequency Range

Input power frequency range shall be from 47.5 to 63 Hz over the specified input voltage range.

5.2.3 Quick specification review

- Input current

  1.2A (max) at 90VAC input and full load ,
  0.6A (max) at 264 VAC input and full load.

- Inrush current @ cold start

  30A(0-peak)@ 110Vac ,50A(0-peak) @ 220Vac

  (measured when switched off for at least 10 mins.)

- Output

	Tolerance	Output Current		Volt Tolerance
Output Volt	-	MIN	MAX	
+5Vdc	±5%	0A	1.0A	4.8~5.2V dc
+5Vdc	±5%	0A	1.5A	4.8~5.2V dc
+12Vdc	±5%	0A	2.2A	11.4~12.6Vdc

- Total output power: 48 Watt max.
- Withstanding voltage : 1.5Kvac or 2.2KVdc for 1 minute.
- Leakage current : < 0.25mA/100Vac , <3.5mA/230Vac
- Efficiency : 80% min. @115V/230VAC, maximum load.

5.3 Inverter (DC to AC Section)

5.4 Electrical characteristics

5.4.1 FOR AU PANEL M170EN05

	MIN.	TYP.	MAX.	COMMENT
INPUT VOLTAGE	11.4V	12.0V	12.6V	12V±5%
INPUT CURRENT	--------	?A	2A	Vin=12V, Vbrite=3.3V
Normal BACKLIGHT VOLTAGE	--------	700V rms.	--------	
LAMP CURRENT	3mA rms.	7mA rms	7.5mA rms	
DRIVING FREQUENCY	40KHz	50KHZ	80KHz	
EFFICIENCY	--------	75%	--------	Vin = 12V,max brightness
Vin ON/OFF sequence	--------	1S	--------	
OLP TIME	--------	3S	_	Open lamp protection time
BRIGHTNESS RANGE	20%	--------	100%	
Brightness control	0V	_	3.3V	3.3V, brightness max
Brightness	_	260cd/m^2	_	
Strike voltage at 0°C	1700 Vrms	_	_	
Operating life time	30,000 hrs	_	_	(note)

Note:

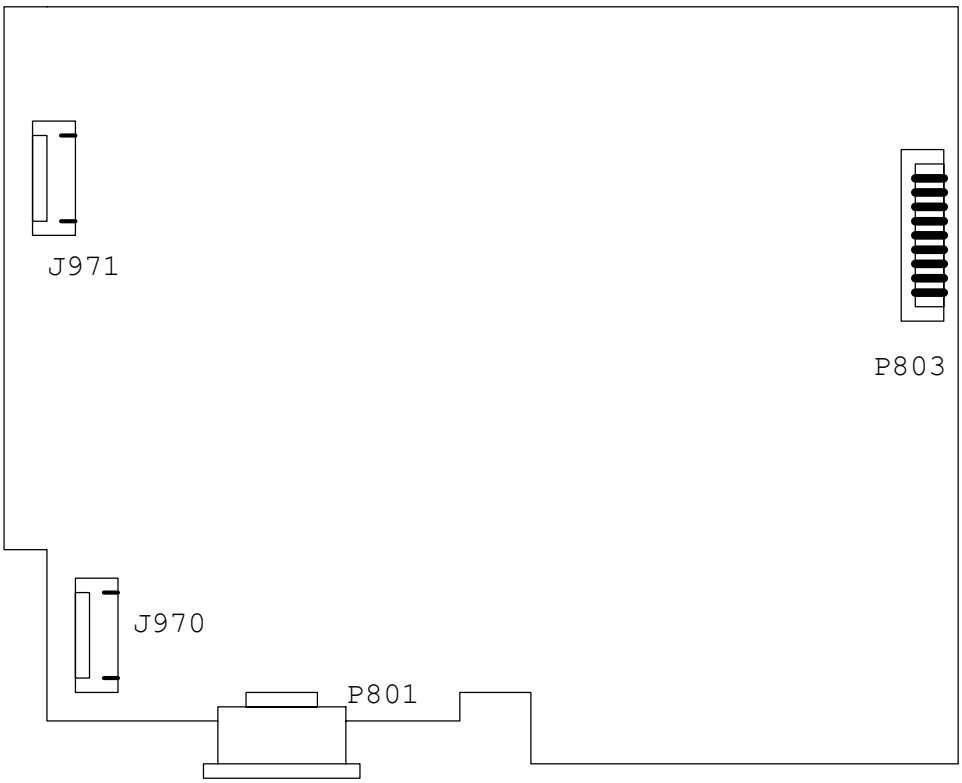
Life time (hr) can be defined as the time in which it continues to operate under the condition:

Ta=25±2°C, IL =7 mArms until one of the following event occurs:

1. When the brightness becomes 50 %
2. When the startup voltage (Vs) at 0°C becomes higher than the maximal value of Vs specified above.

5.5 Connector locations

5.5.1 Connector type



CML174SXW-

Location	Type	Maker	Number of pins
J970, J971,	SM04(4.0)B-BHS-1-TB	JST	4
P803	96113-1203	E&T	10P
P801	HF-301 PCB	AC Inlet	3

5.5.2 Connector pin assignment

5.5.2.1 J970, J971

Pin NO.	Signal	Comment
1	*HV*	*High voltage for lamp*
2	*HV*	*High voltage for lamp*
3	*NC*	*NC*
3	*LV*	*Low voltage (common)*

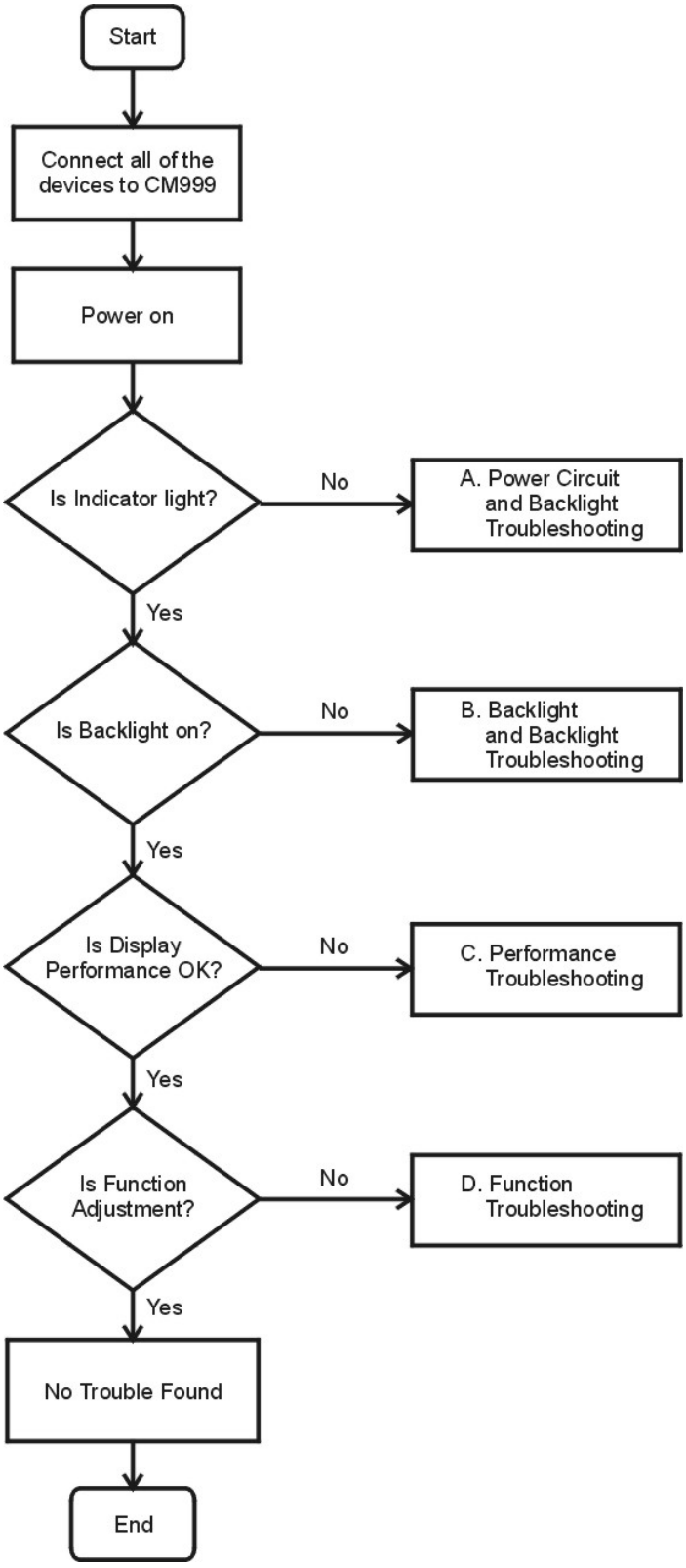
5.5.2.2 J803 For Display control board (Interface)

Pin NO.	*Signal*	*Comment*
1	*+5Vaudio*	*+5Vdc for Audio ckt*
2	*GND/Audio*	*Ground for Audio ckt*

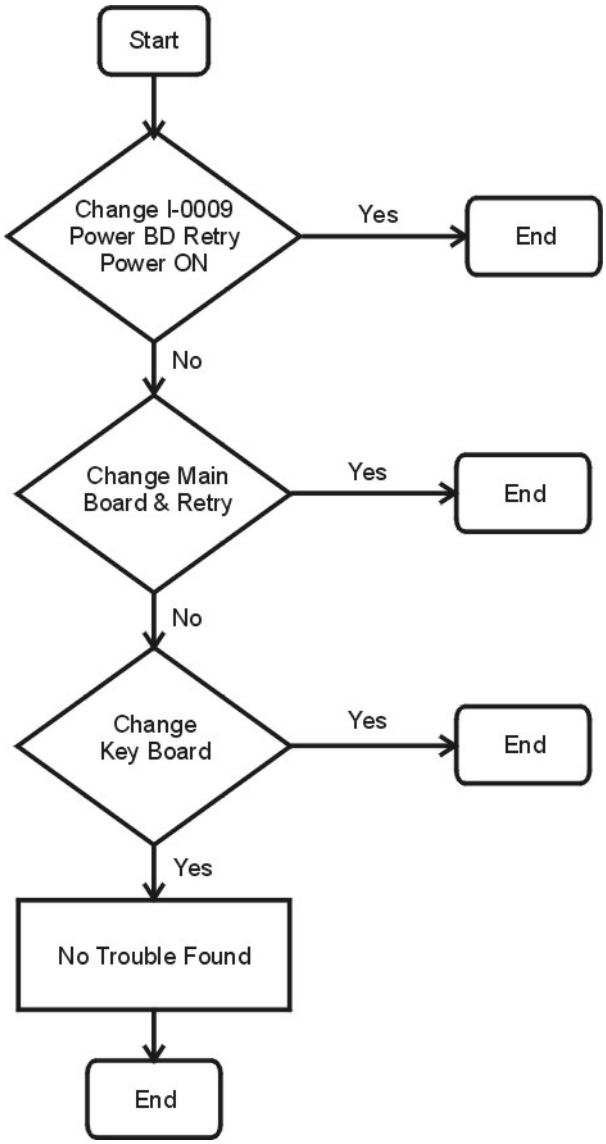
3,4	*GND*	*Common Ground*
5	*BRITE*	*Brightness adjustable range: 0.4V<min>~3.3V<max>*
6	*Sleep*	*Power saving control(Active High) Normal:-0.3~1.0V. Sleeping:2.0~5.5V*
7	*Enable*	*Backlight ON/OFF control (Active High) ON:1.5~5.5V OFF:-0.3~1.0V.*
8,9,10	*Vcc*	*+5Vdc supply to Interface BD, always on.*

6. TROUBLESHOOTING

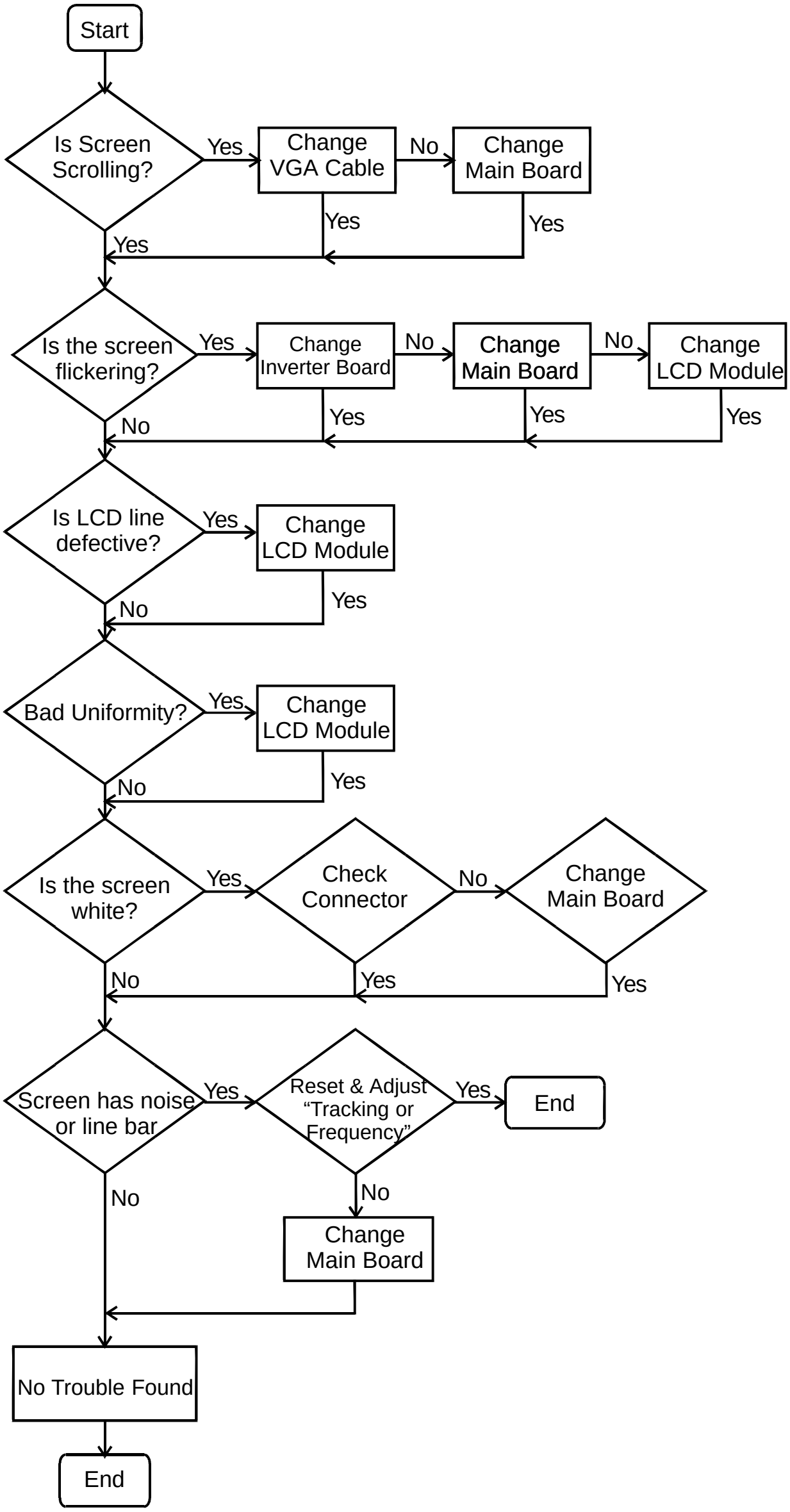
6.1 Main Procedure



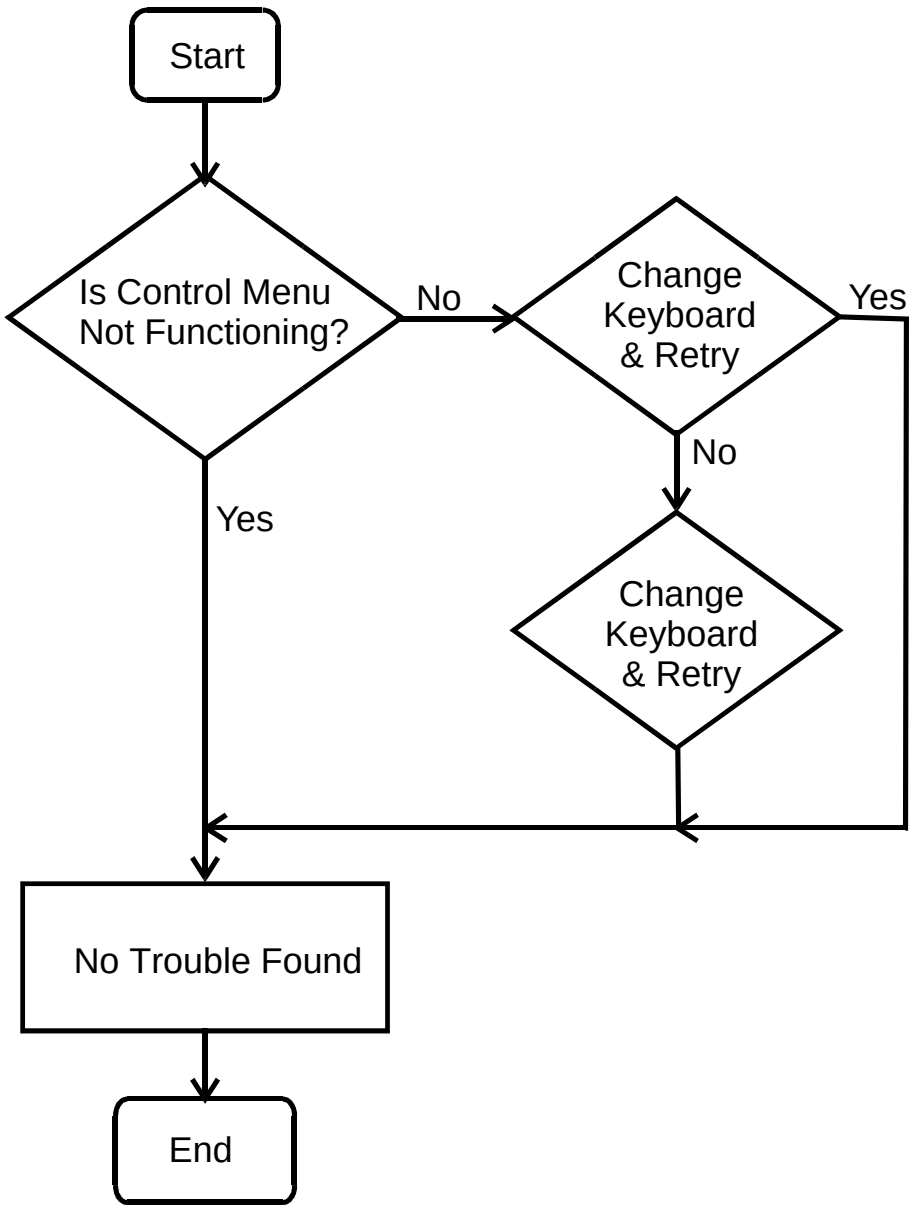
6.1.1 Power Circuit and Backlights Troubleshooting



6.1.2 Performance Troubleshooting



6.1.3 Function Troubleshooting



7. MECHANICAL REQUIREMENTS

7.1 Vibration and Shock

All testing shall be done in each of three mutually perpendicular axes, referenced to the position of the system as it is in front of the user (i.e., front-to back, side-to-side, and top-to-bottom).

7.1.1 Non-Operating

The unit should suffer minimal visible cosmetic damage or damage that presents a safety hazard, or impairs the setup and operation of the system after testing.

Sinusoidal Vibration: 0.75 G zero-to-peak, 10 to 500Hz, 0.5 octave / minute sweep rate. This requires one sweep, 10 to 500 to 10Hz, along each of the three axes.

Random Vibration: 0.008 G^2/Hz, 10 to 500 Hz, nominal 2 GRMS. The test shall be for one hour for each of the three axes.

Half Sine Wave Shock: 120 G peak, half sine pulse, 2 ms pulse duration. Testing shall consist of one shock in each direction in each axis, for a total of 6 shock inputs.

Square Wave Shock: *40 G peak acceleration, 160 inches / second velocity change. There shall be one shock in each direction in each axis, for a total of 6 shock inputs.*

7.2 Package Drop Specification

Listed below are standards of drop heights for monitor product

Product Weight	height Specs
<9.1 kg	0.76 m
9.2~18.2 kg	0.66 m
18.3~27.2 Kg	0.61 m
27.3~45.4 Kg	0.46 m

7.2.1 Drop Test Sequence

Drop Order	*Drop point*	*Drop Times*
1	*Right Front Bottom Corner*	*1*
2	*Right Bottom Edge*	*1*
3	*Right Front Edge*	*1*
4	*Front Bottom Edge*	*1*
5	*Bottom Side*	*1*
6	*Top Side*	*1*
7	*Front Side*	*1*
8	*Back Side*	*1*
9	*Left Side*	*1*
10	*Right Side*	*1*

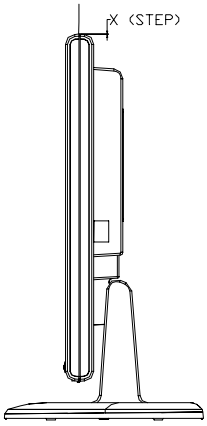
7.3 Dimension Size and Weight

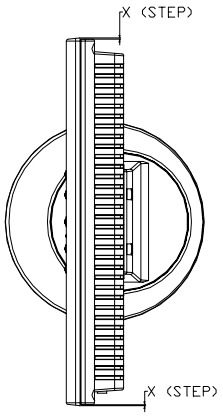
Dimension size	374 (W) x 394.5 (H) x 204 (D)
Net Weight	5Kg
Gross Weight	7Kg

7.4 Gap Spec.

7.4.1 The step between front bezel and back cover shall be within specification.

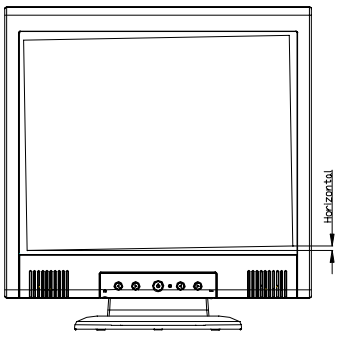
Top	Left and Right
Back cover concavity	Back cover concavity
0 mm ≤ X ≤ 0.8 mm	0 mm ≤ X ≤ 0.8 mm



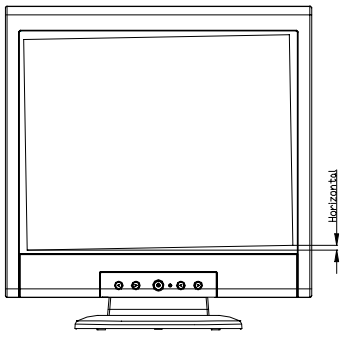


LCD Horizontally

The angle between front bezel and LCD unit in bottom side should not large than 1.0mm.

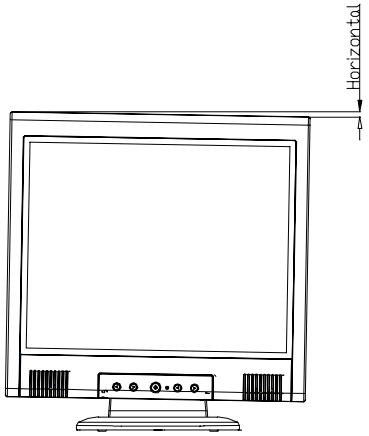


CML175SXW

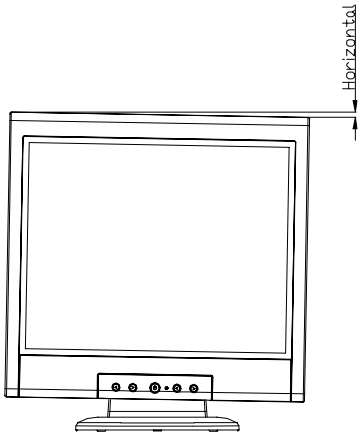


CML174SXW

The angle between from bezel and LCD unit in bottom side should not large than 4.0mm



CML175SXW



CML174SXW

7.5 Tilt Base Rotation

Tilt up 30 ± 1°/ down 5 ±1°

7.6 Swivel Base Rotation

Swivel Right 45 ±1° / Left 45 ±1°

7.7 Plastic Material

Front Bezel ABS 94V-0

Back Cover ABS 94V-0

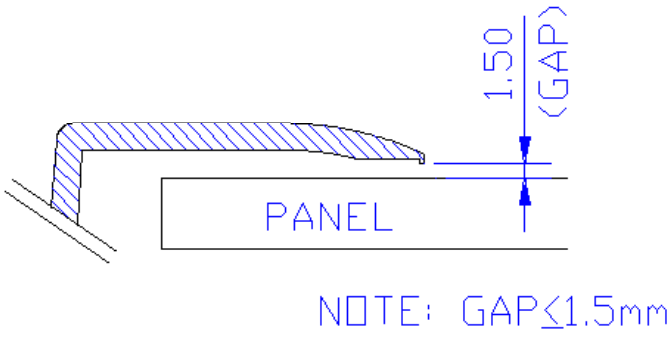
The Others ABS 94HB

TCO' 99(Optional)

Front Bezel	PC + ABS 94 – 5V
BACK COVER	PC + ABS 94 – 5V
The others	ABS 94 HB

7.8 GAP Spec.

Gap between panel with bezel is 0 mm < gap < 1.5 mm



8. Power Line Transient Test (IEC 61000-4-4 Fast Transients/Burst)

TEST CONDITIONS & PROCEDURE: (Follow IEC 61000-4-4)

Test Condition :

The condition is base on operating with 50Ω load.

8.1 Peak Voltage:

2 KV (applies the Level 3 typical Industrial Environment" of IEC 61000-4-4)

8.2 Polarity : +/-

8.3 Repetition Frequency of the impulse : 5 KHz.

8.4 Rise-Time : 5ns ± 30%

8.5 Impulse Duration: 50 nS ± 30%

8.6 Relation to Power Supply: Asynchronous

8.7 Burst Duration: 15 ms ± 20%

8.8 Burst Period: 300 ms ± 20%

8.9 Climatic Conditions:

- Ambient Temperature: 15°C to 35°C
- Relative Humidity: 45% to 75%
- Atmospheric Pressure: 86 kPa to 106 kPa

8.10 Test Procedure:

The monitor Display set high-resolution mode, AC input use AC 240V.

Note :

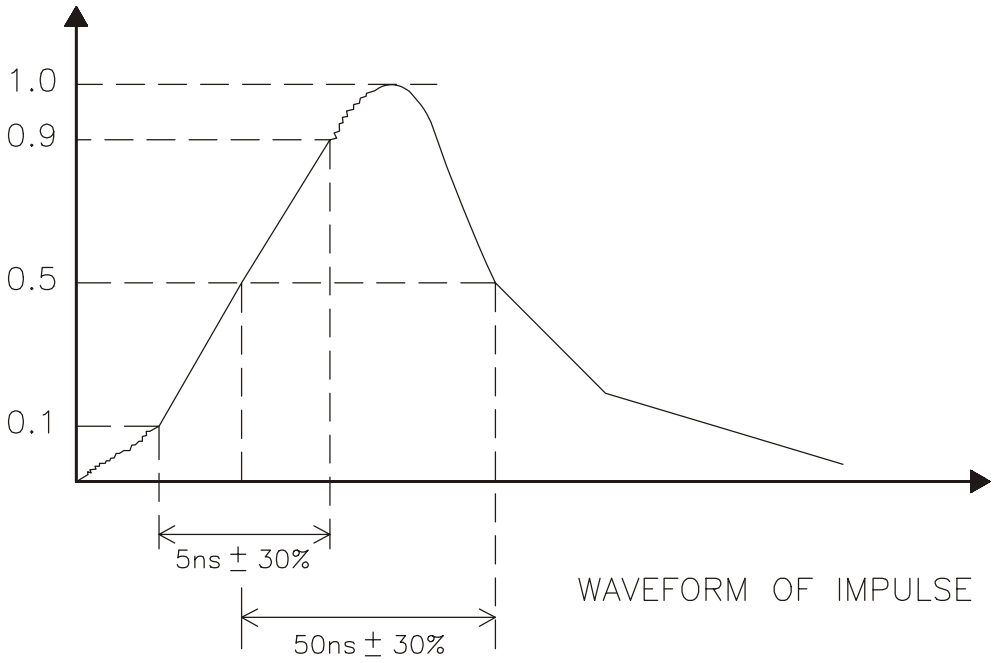
8.10.1

IEC 61000-4-4 defines that power supply, I/O line, and control line all shall be performed the transient test, but the I/O line and control line is applied with only half of peak voltage (1 KV).

8.10.2

For the comparison of wave-shape generated by different generator, so the test must uses a scope with at least 400 MHz bandwidth, and coupled to 50 Ω to monitor the rise-time, impulse, duration, and repetition rate of the impulses within one burst.

WAVESHAPE



WAVEFORM OF IMPULSE

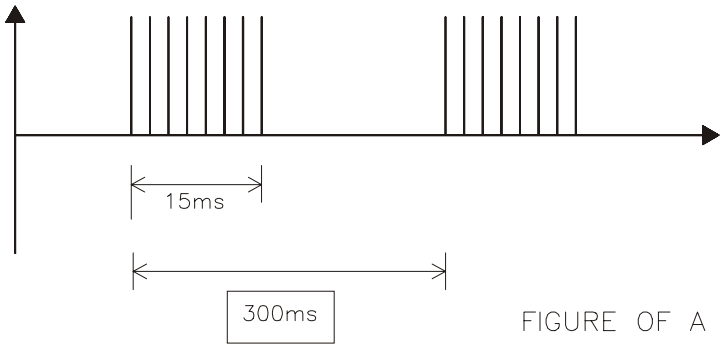


FIGURE OF A FAST TRANSIENT/BURST

9. Power Line Surge Test (IEC 61000-4-5 Surge)

9.1 Climatic Condition

The climatic conditions shall be within the following ranges:

9.1.1 Ambient Temperature: 15℃ to 35℃

9.1.2 Relative Humidity: 10% to 75%

9.1.3 Atmospheric Pressure 86kPa(860 mbar)to 106kPa (1060mbar)

Note: The temperature and relative humidity should be recorded in the test report.

9.2 Test Conditions:

9.2.1 Wave-shape of the current surge: (refer to IEC 61000-4-5)

Open circuit voltage: (1.2 / 50 μs)

Short circuit current: (8 / 20 μs)

9.2.2 Polarity: positive / negative

9.2.3 Phase shifting:in a range between 0º to 270º versus the AC line phase angle

9.2.4 Repetition rate:at least 1 per minute

9.2.5 Number of tests: at least 5 positive and 5 negative at the selected points.

9.3

The surge will be applied between lines and between lines and ground.

9.4

If not otherwise specified, the surge to power supply circuits shall be applied synchronized to the voltage phase at the zero crossing and the peak value of the AC voltage wave. (Positive and negative)

9.5

The surge voltage for test is from 1 KV and increases 1 kV for each step.

9.6

The recommended severity levels for the surge voltage test is 2.0 KV, and without any degradation or loss of function that is not recoverable due to damage of component or software allowed.

9.7 Display set high-resolution mode, AC input use AC 240V**.**

10. ENVIROMENT REQUIREMENT

10.1 Operating

Temperature	5°C ~ 40°C
Relative Humidity	20% to 80%
Altitude	Sea level to 8000ft

10.2 Storage or Shipment

Temperature	-20°C ~ +60°C
Relative Humidity	5% to 85%
Altitude	Sea level to 40,000ft

10.2.1 TEST PROCEDURE:

- Put in temperature chamber under 60°C Time:24 hours
- Back to room temperature Time: 4 hours
- Put in temperature chamber under -20°C Time:24 hours
- Back to room temperature Time:4 hours
- The process repeat 2 times.

11. REGULATION COMPLIANCE

11.1 This product comply to the most current revisions of following regulations:

UL/CUL {UL 1950/ CSA C22.2 NO950}	Standard for Safety of Information Technology Equipment including Electrical Business Equipment
EN 60950/CB Scheme	Safety of Information Technology Equipment including Electrical Business Equipment
MPR 1990:8	Test methods for visual display units.
MPR 1990:10	User handbook for evaluation visual display units.
ISO 9241-3:	Ergonomic requirements for office work with visual display terminals (VDTs)-Visual display requirements.
ISO 9241-7:	Ergonomic requirements for office work with visual display terminals (VDTs)-Requirements for display with reflections.
ISO 9241-8:	Ergonomic requirements for office work with visual display terminals (VDTs)-Requirements for displayed colours.
NUTEK/EPA	Requirements of power saving according to NUTEK Spec. 803299/94/96, EPA Energy star.
TCO 1999 (option)	Requirements for Environmental Labeling of Personal Computers. Test methods for Ergonomic, Emission, Energy Efficiency, safety.
TUV/GS	Safety regulation for displays work places in the office sector.
FCC 47 CFR, Chapter 1, Subchapter A, Part 15, Subpart B	A digital device that is marketed for use in a residential environment not withstanding use in commercial, business and industrial environments.
CISPR 22	Limits and methods of measurements of radio interference characteristics of information technology equipment.
CE LVD Directive (73/23/EEC)	Safety: EN60950
CE EMC Directive (89/336/EEC)	EMI: EN55022 class B Harmonics: EN61000-3-2 Voltage Fluctuation/Flicker: EN61000-3-3 Immunity: EN55024
IEC 61000-4	IEC 61000-4-2 Electrostatic Discharge IEC 61000-4-3 Radiated Electromagnetic Field IEC 61000-4-4 Fast Transients/Burst IEC 61000-4-5 Surge IEC 61000-4-6 Conducted Disturbance, Induced by Radio Frequency Fields IEC 61000-4-8 Power Frequency Magnetic Field IEC 61000-4-11 Voltage DIP/Interruption
VCCI (option)	Specification for limits and methods of measurement of radio interference characteristics of information technology equipment. Class B conformity verification report from the VCCI
BSMI (option)	CNS 13438, Class B

11.2 Electrostatics Discharge (ESD)

E.S.D Test

This test follow the IEC 61000-4-2

Discharge Voltage Level :

Criteria	Contact Discharge (KV)	Air Discharge(KV)
Class C	±4	±4
Class B	±6	±8
Class A	±8	±15

Class A **:** Temporary degradation or loss of function or performance which requires operator Intervention or system reset.

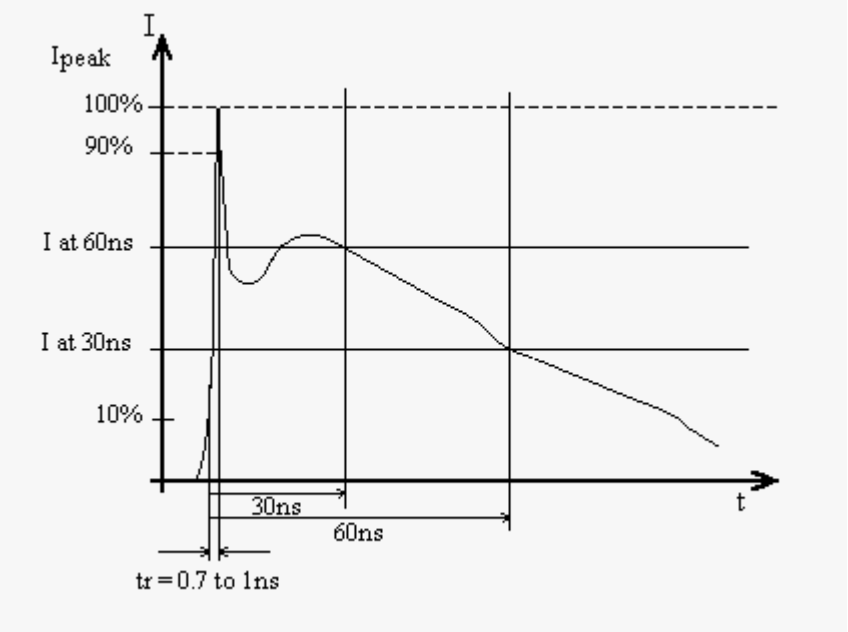
Class B **:** Temporary degradation or loss of function or performance which is self- recoverable

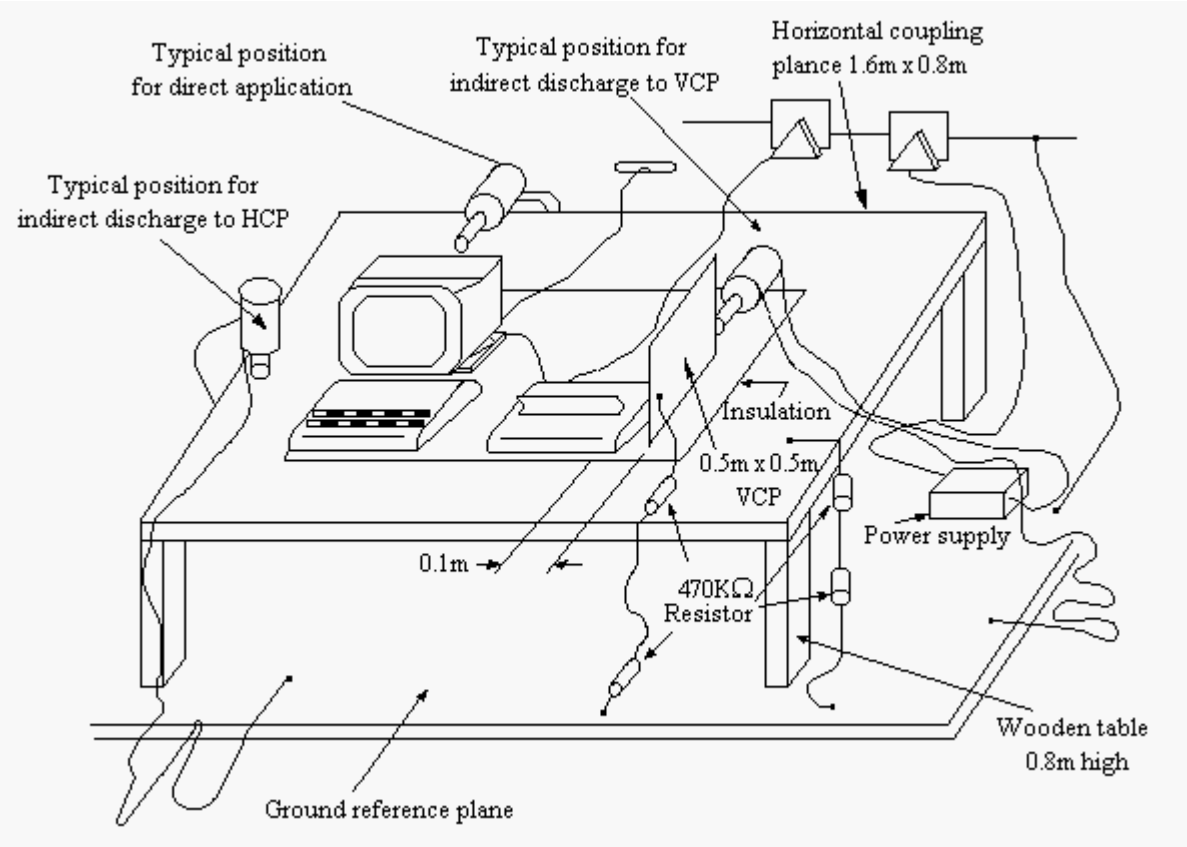
Class C **:** Normal performance within the specification limits

Discharge times: 20 times for each discharge point, time interval 1 second.

In the case of acceptance tests, the test program and the interpretation of the test results are subject to agreement between manufacturer and user.

The test documentation shall include the test conditions and the test results.





Ambient temperature : 15°C to 35°C
Relative humidity : 30% to 60%

12. QUALITY AND RELIABILITY

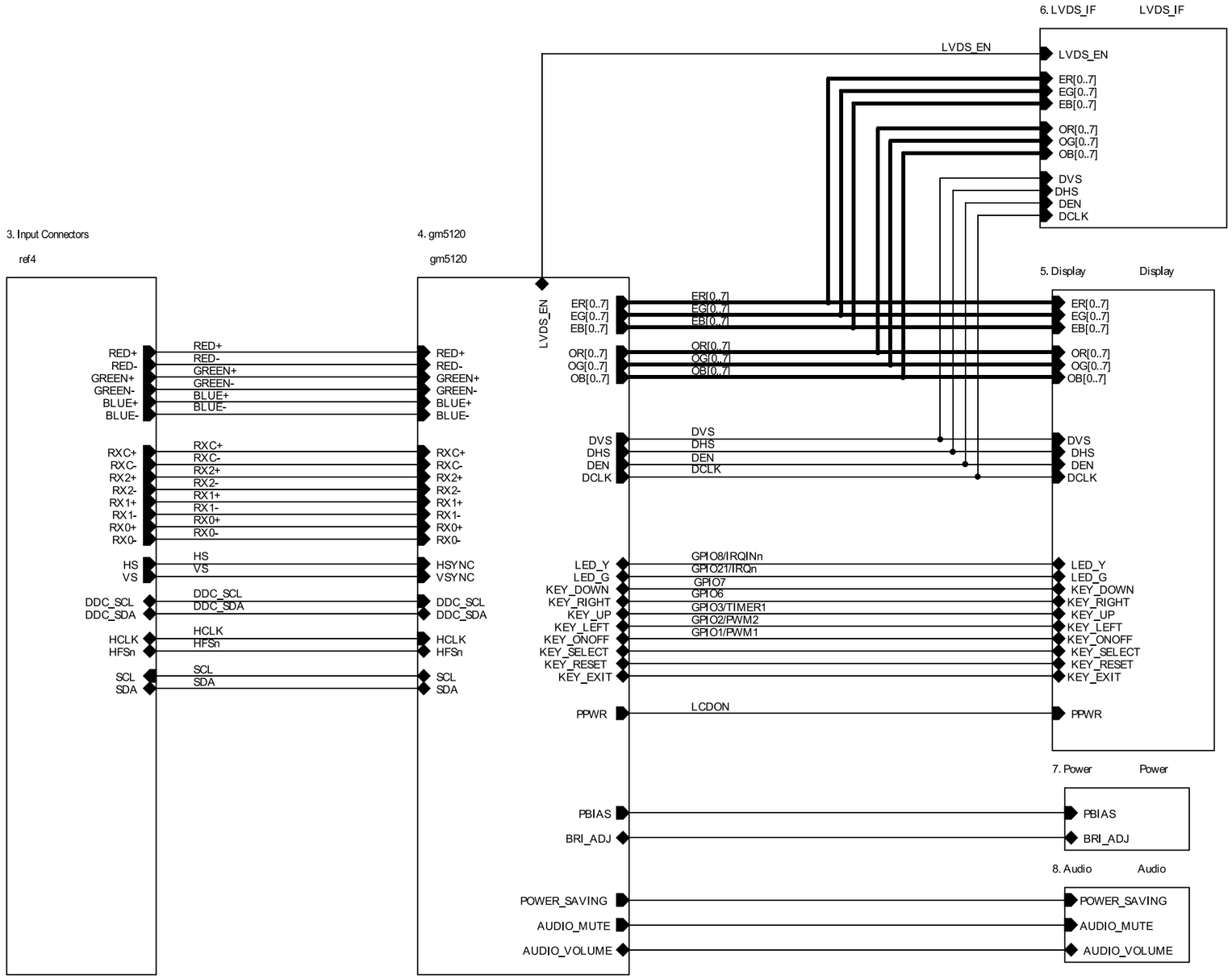
12.1 Quality Assurance

Unless otherwise specified in this specification or the applicable purchase order, the supplier shall be responsible for maintaining a statistical process program or performing inspections that are sufficient to assure that the parts supplied meet the requirements specified herein.

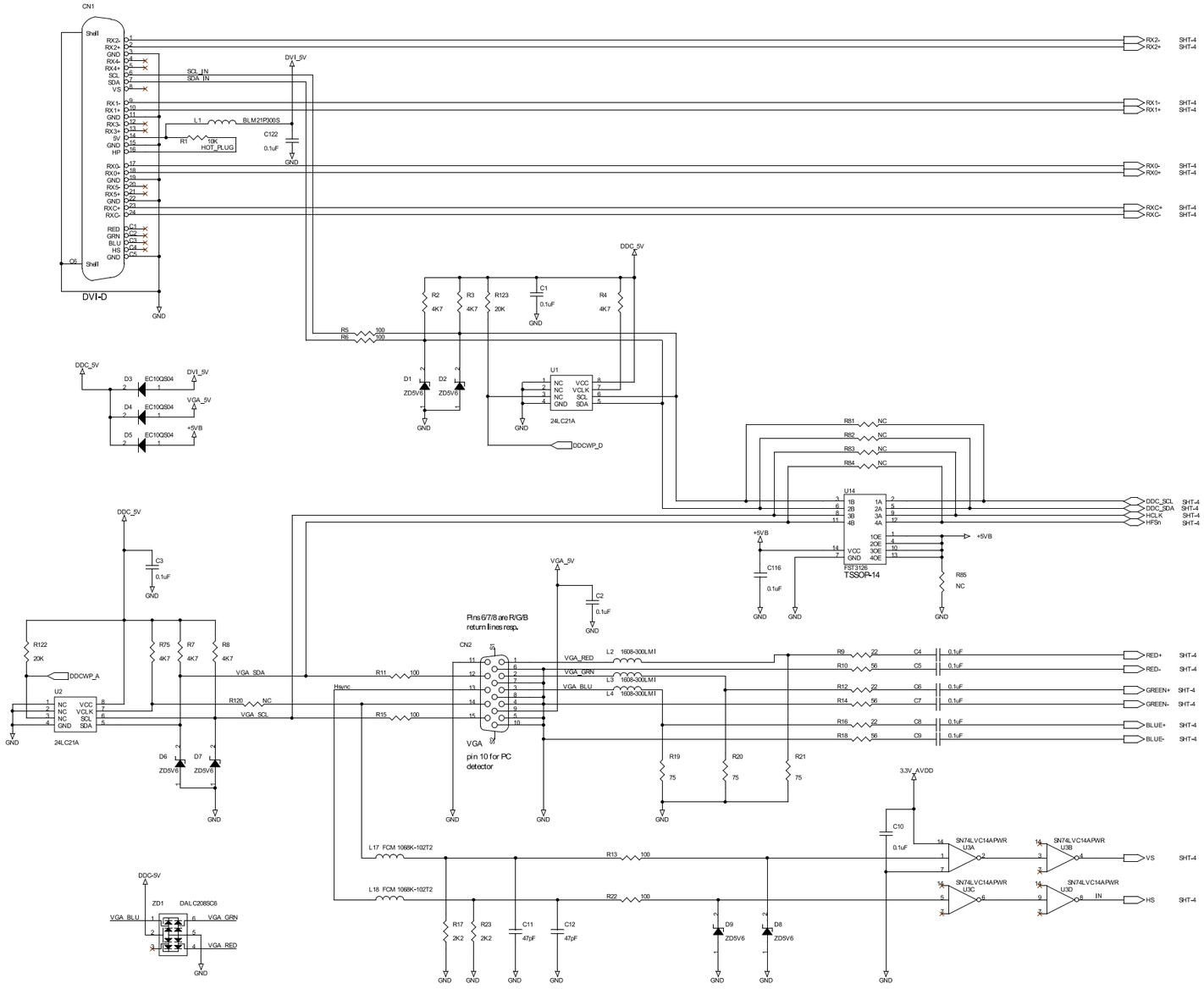
12.2 Reliability

The product shall have a designed MTBF of greater than 20,000 hours during its useful life.

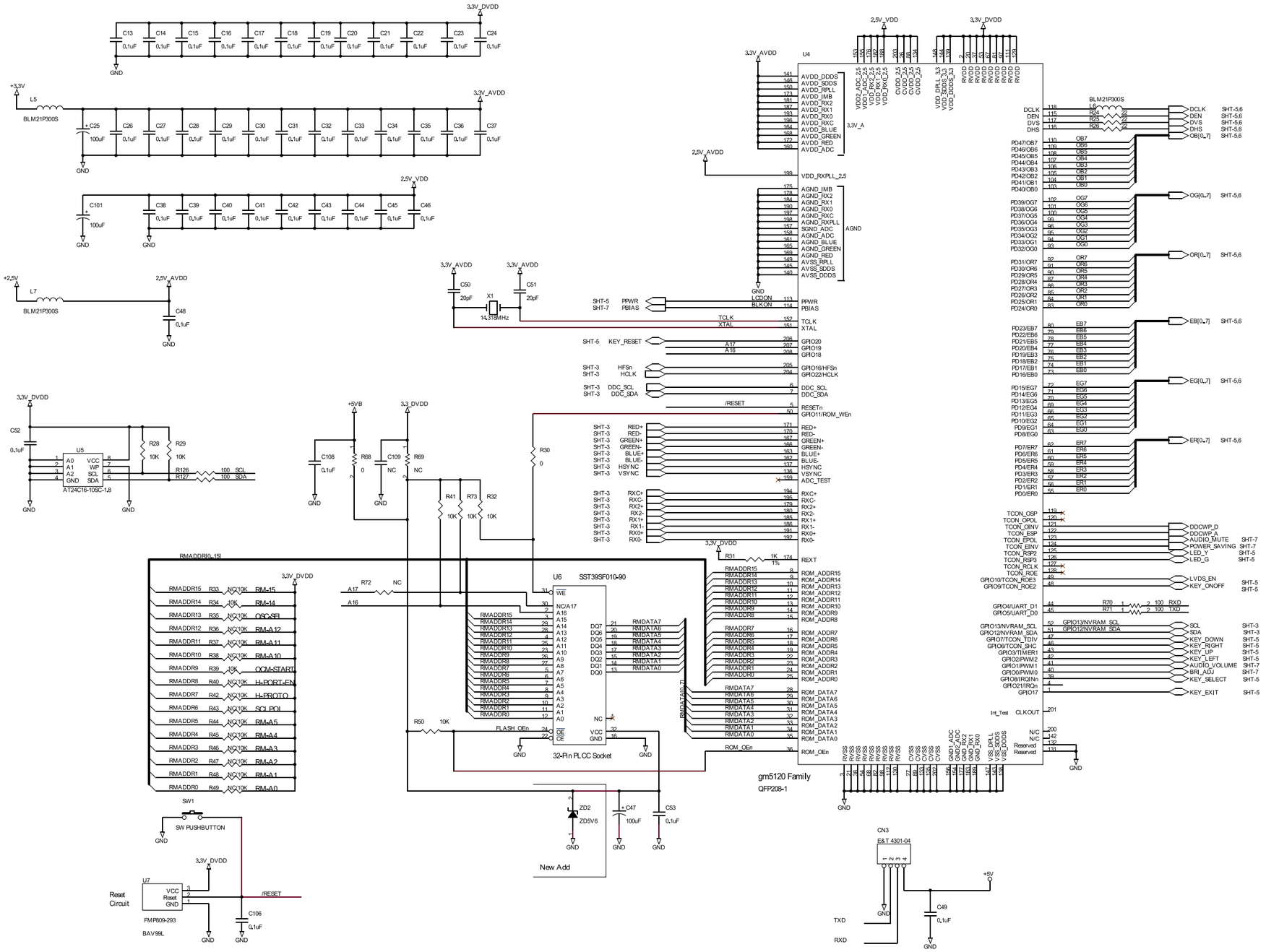
Appendix A: PCBA Assembly



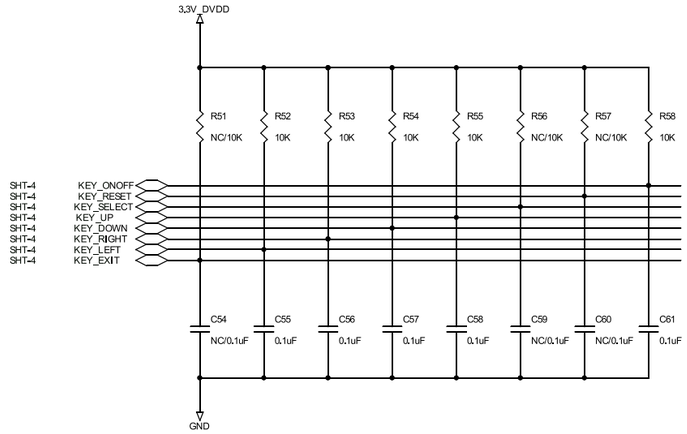
N0. 0532	VL713 LJM777 - Top Level	HITACHI

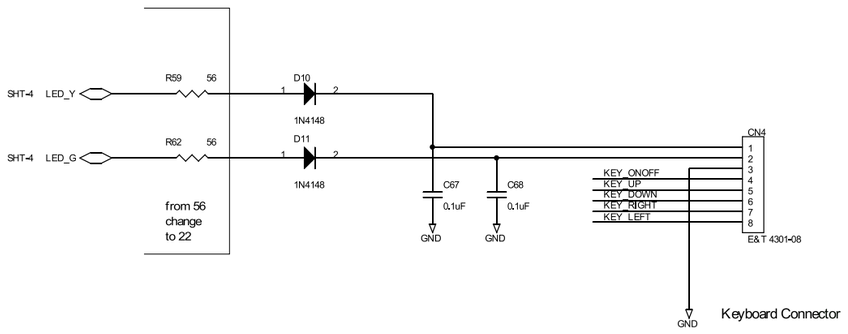


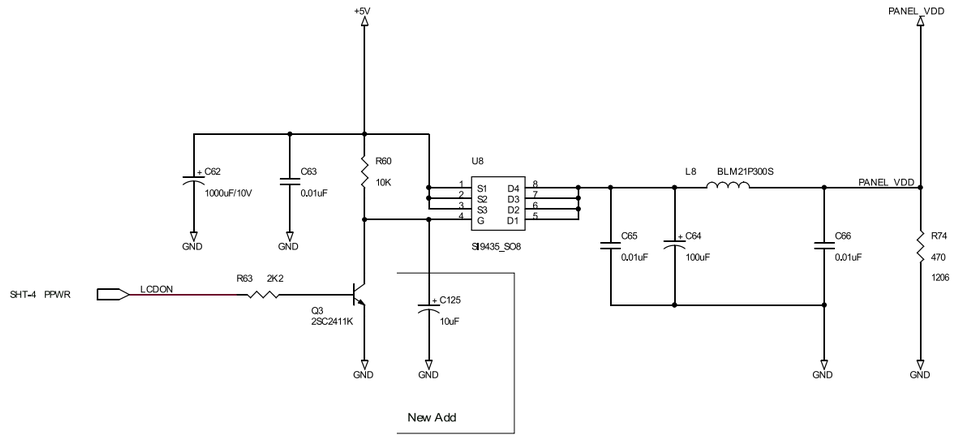
No. 0532	VL713 LJM777 - Input	HITACHI



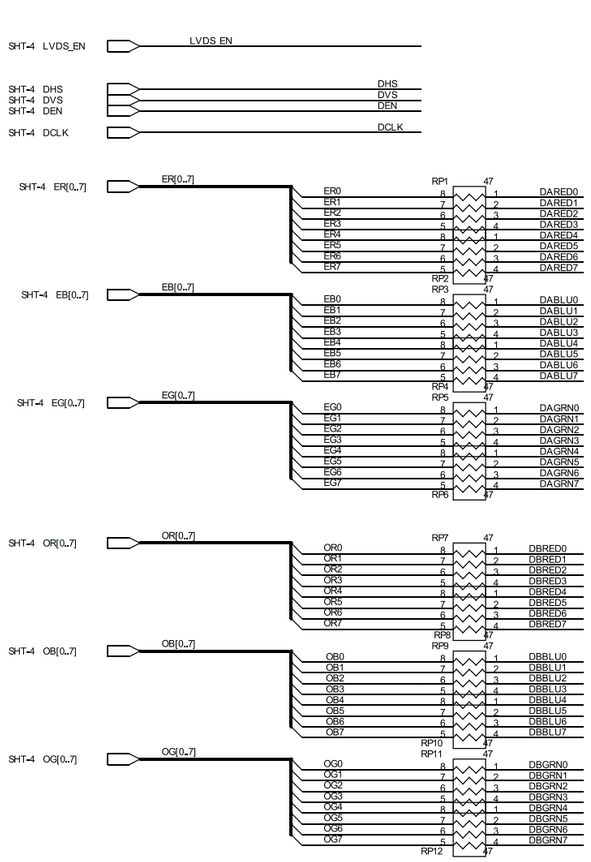
No. 0532	VL713 LJM777 - gm5115	HITACHI

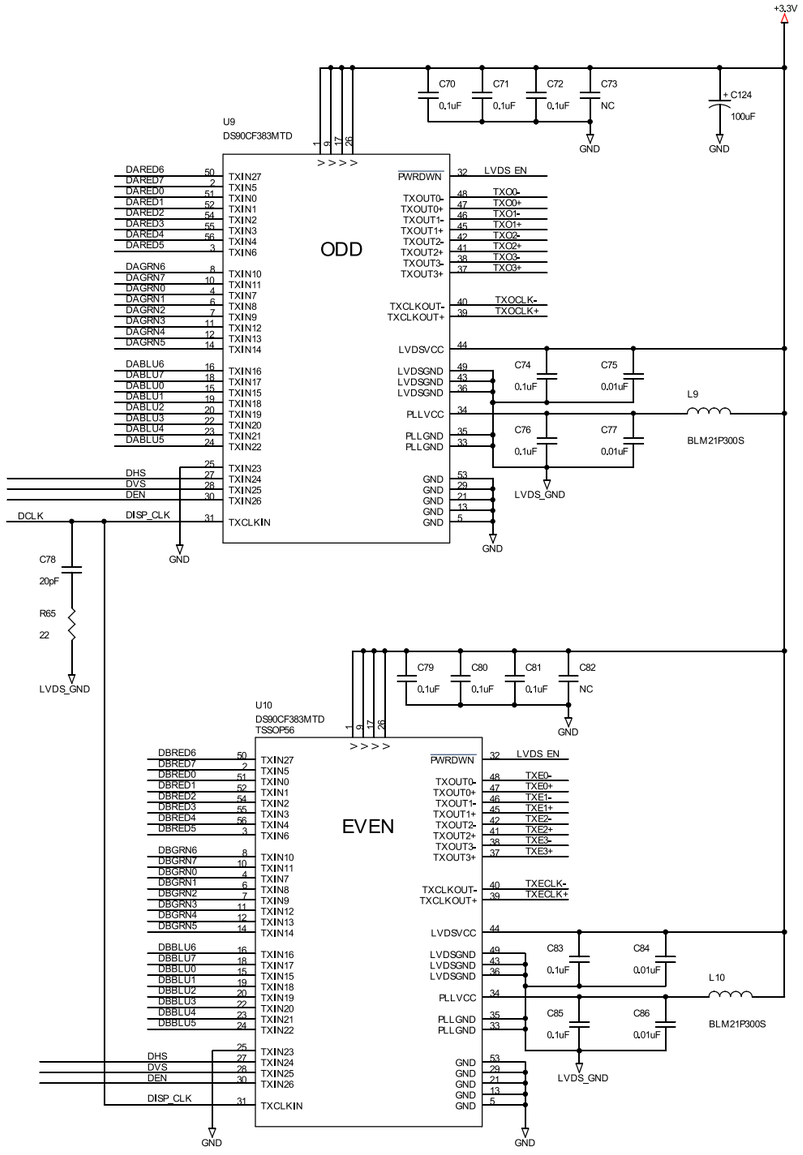




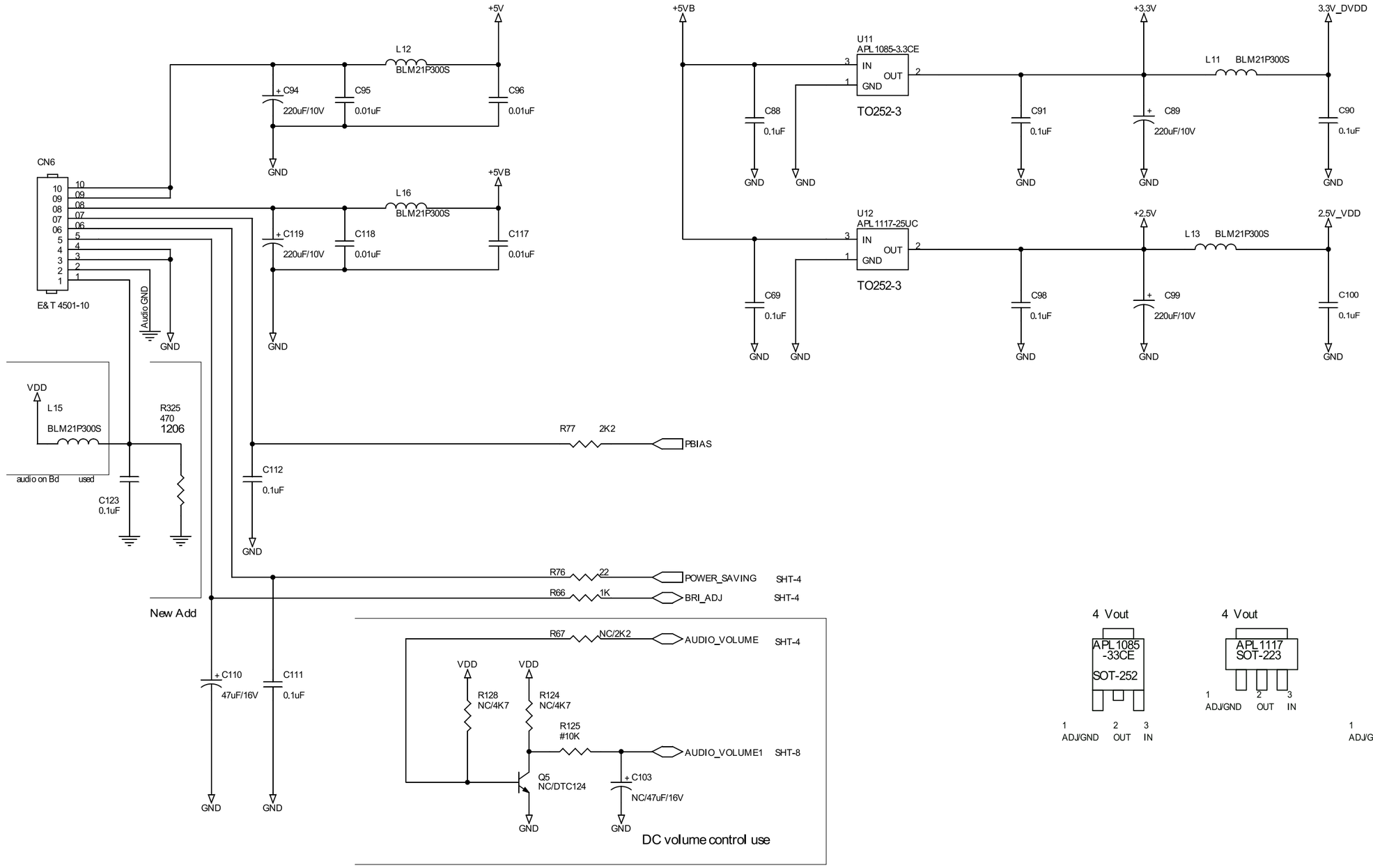


No. 0532	VL713 LJM778 - Display	HITACHI

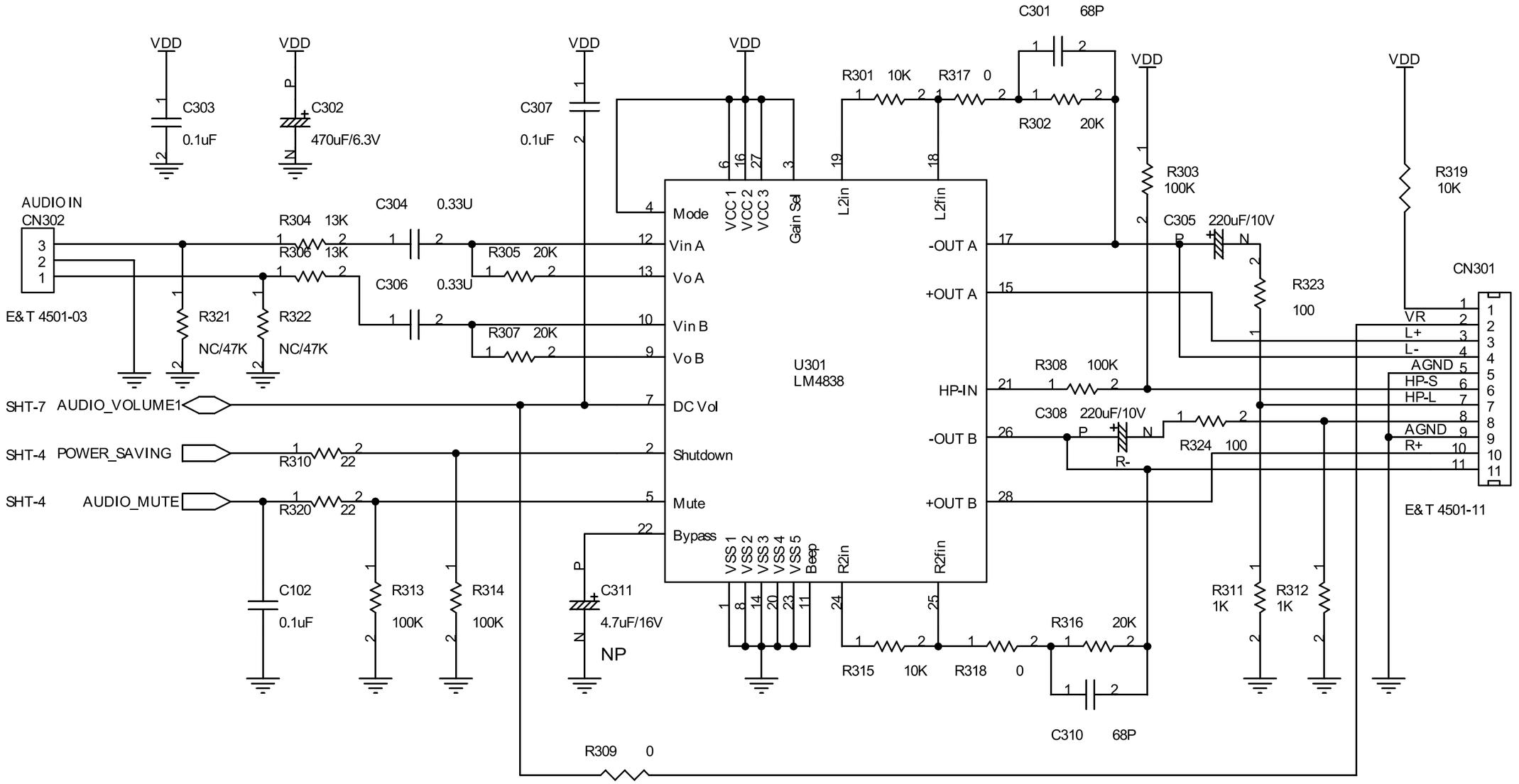



+3.3V
U9
DS90CF383MTD
TSSOP56
ODD
C70 C71 C72 C73 C124
0.1uF 0.1uF 0.1uF NC 100uF
GND
DARED6 DARED7 DARED0 DARED1 DARED2 DARED3 DARED4 DARED5
DAGRN6 DAGRN7 DAGRN0 DAGRN1 DAGRN2 DAGRN3 DAGRN4 DAGRN5
DABLU6 DABLU7 DABLU0 DABLU1 DABLU2 DABLU3 DABLU4 DABLU5
TXIN27 TXIN5 TXIN0 TXIN1 TXIN2 TXIN3 TXIN4 TXIN6
TXIN10 TXIN11 TXIN7 TXIN8 TXIN9 TXIN12 TXIN13 TXIN14
TXIN16 TXIN17 TXIN15 TXIN18 TXIN19 TXIN20 TXIN21 TXIN22
TXIN23 TXIN24 TXIN25 TXIN26
TXCLKIN
PWRDWN
LVDS_EN
TXOUT0- TXOUT0+ TXOUT1- TXOUT1+ TXOUT2- TXOUT2+ TXOUT3- TXOUT3+
TXO0- TXO0+ TXO1- TXO1+ TXO2- TXO2+ TXO3- TXO3+
TXCLKOUT- TXCLKOUT+
TXCLK- TXCLK+
LVDSVCC
LVDSGND
PLLVCC
PLLGND
C74 C75 C76 C77
0.1uF 0.01uF 0.1uF 0.01uF
L9
BLM21P300S
LVDS_GND
DHS DVS DEN DCLK DISP_CLK
C78 20pF
R65 22
U10
DS90CF383MTD
TSSOP56
EVEN
C79 C80 C81 C82
0.1uF 0.1uF 0.1uF NC
C83 C84 C85 C86
0.1uF 0.01uF 0.1uF 0.01uF
L10
BLM21P300S
CN5
PANEL SIGNAL OUTPUT
GND GND GND RXE0- RXE0+ GND RXE1- RXE1+ GND RXE2- RXE2+ GND RXEC- RXEC+ GND RXE3- RXE3+ GND RXO0- RXO0+ GND RXO1- RXO1+ GND RXO2- RXO2+ GND RXOC- RXOC+ GND RXO3- RXO3+ GND GND NC PD NC VDD VDD VDD
TXE0- TXE0+ TXE1- TXE1+ TXE2- TXE2+ TXECLK- TXECLK+ TXE3- TXE3+ TXO0- TXO0+ TXO1- TXO1+ TXO2- TXO2+ TXOCLK- TXOCLK+ TXO3- TXO3+
PANEL_VDD
PANEL_VDD
E&T_98210-4011-0,50m
GND LVDS_GND
Connect LVDS grounds to GND at one single point only.

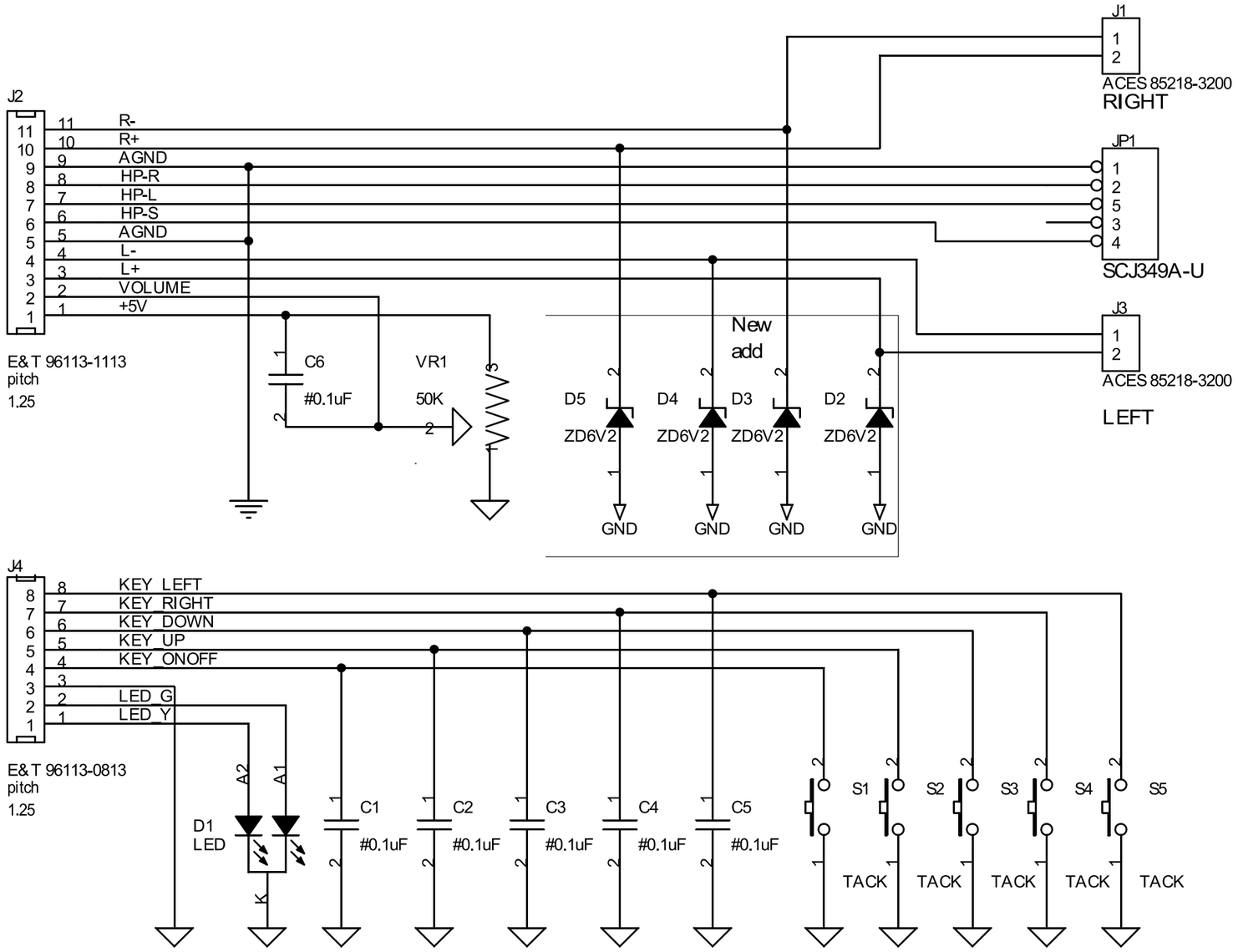
No. 0532	VL713 LJM777 - LVDS_IF	HITACHI



N0. 0532	VL713 LJM777 - Power Circuit	HITACHI



Degital volume controal CN301 is 9 pin, Analog volume control CN301 is 11 pin.



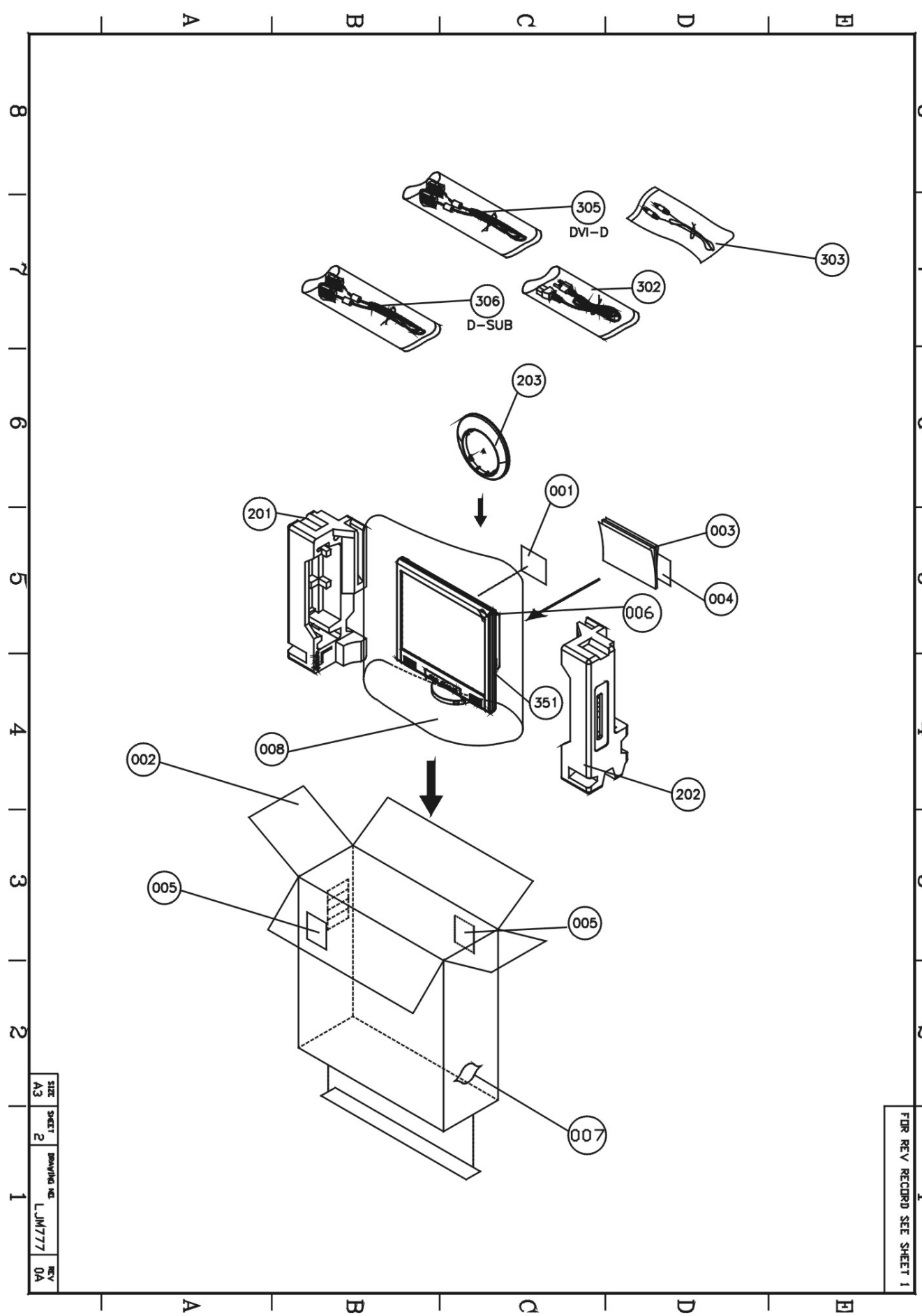
No. 0532	Key Circuit	HITACHI

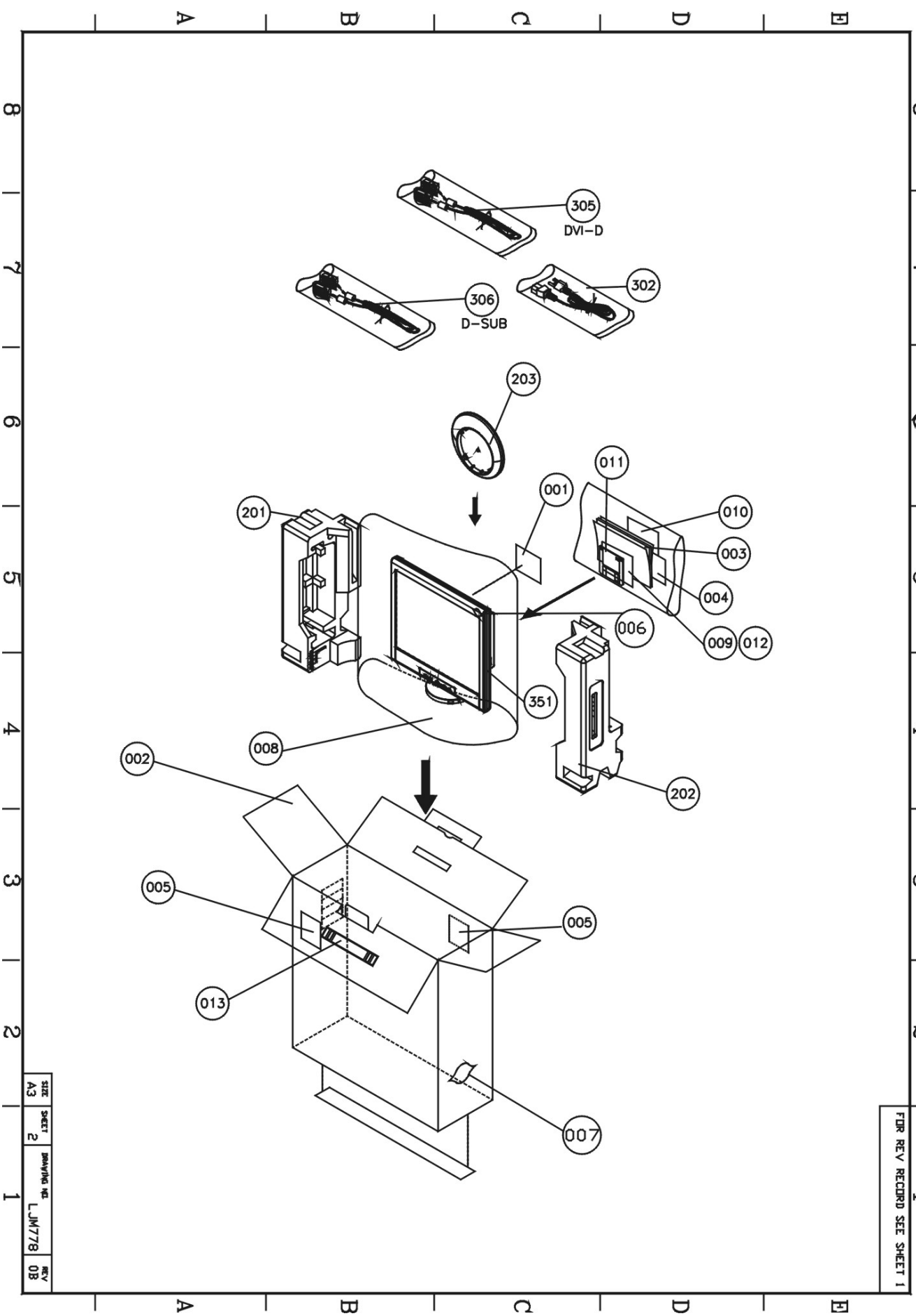
THE UPDATED PARTS LIST

FOR THIS MODEL IS

AVAILABLE ON ESTA

Appendix B: Display Unit Assembly


305
DVI-D
303
306
D-SUB
302
203
001
201
003
004
006
351
008
002
202
005
005
007
FOR REV RECORD SEE SHEET 1
SIZE A3
SHEET 2
DRAWING NO. LJM777
REV 0A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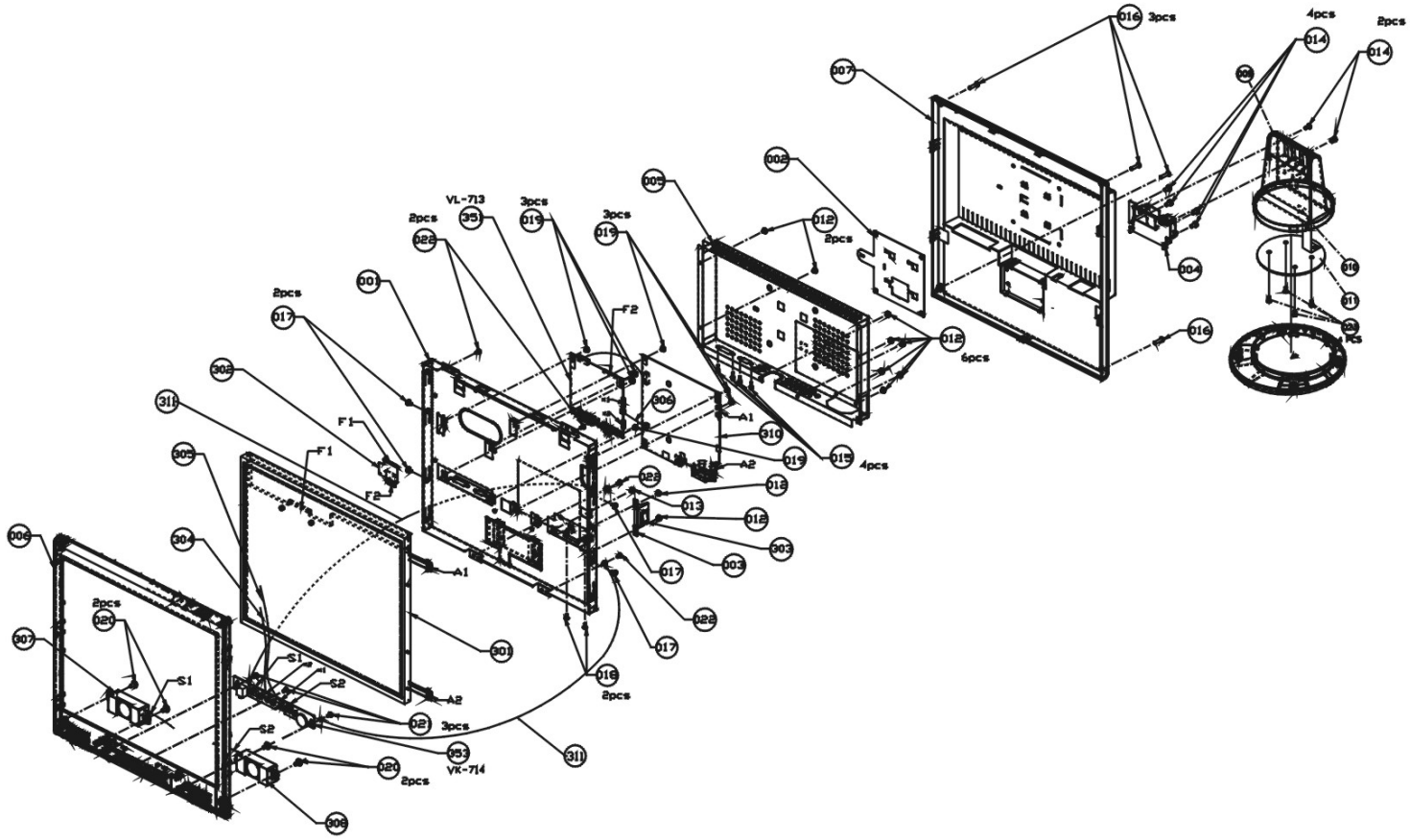
DVI-D
306
D-SUB
302
203
011
001
201
010
003
004
006
009
012
351
008
002
202
005
005
013
007
FOR REV RECORD SEE SHEET 1
SIZE A3
SHEET 2
DRAWING NO. LJM778
REV 08

FOR REV RECORD SEE SHEET 1

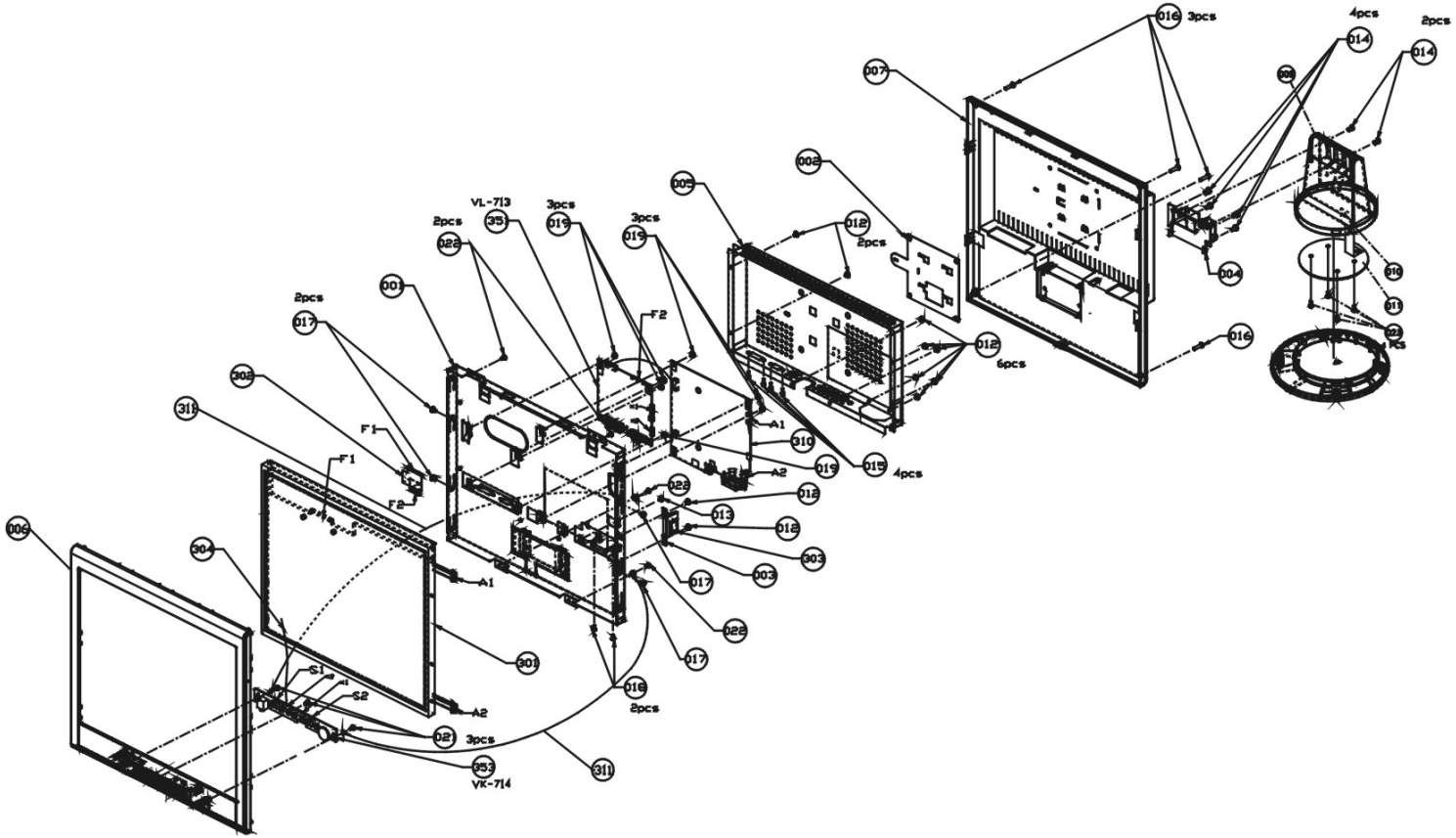
FOR AU PANEL (JM777)



SIZE	SHEET	DRAWING NO.	REV
A3	2	582713	0A

FOR REV RECORD SEE SHEET 1

FOR AU PANEL (JM778)



SIZE	SHEET	DRAWING NO	REV
A3	2	582714	0A

HITACHI

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